DOCUMENT RESUME

ED 284 164 CS 008 732

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TITLE The Subtle Danger: Reflections on the Literacy Abilities of America's Young Adults.
INSTITUTION Educational Testing Service, Princeton, NJ. Center for the Assessment of Educational Progress.
REPORT NO 16-CAEP-01; ISBN-0-88685-060-6
PUB DATE Jan 87
NOTE 67p.; For the report, "Literacy: Profiles of America's Young Adults," see ED 275 701.
AVAILABLE FROM Center for the Assessment of Educational Progress, Educational Testing Service, Rosedale Rd., Princeton, NJ 08541-0001.
PUB TYPE Viewpoints (120)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Adult Literacy; Critical Thinking; Educational History; Educational Testing; Functional Literacy; International Trade; Reading Ability; Reading Skills; Writing Skills
IDENTIFIERS National Assessment of Educational Progress

ABSTRACT

Noting that the demands of literacy have increased and that it is in this context that literacy performance must be evaluated, this book summarizes the most important results of the Young Adult Literacy Assessment, and provides thoughtful analysis of their implications from the standpoint of unemployment, economic competitiveness, the problem of poverty, and inequality among subgroups in the population. The first chapter of the book provides an orientation to the problem of literacy, defining literacy and differentiating between schooling and education, while the second chapter traces the history of literacy and its assessment in the United States. The Young Adult Literacy Assessment is described in the third chapter, including sampling methods and text types used, and how the results are categorized, while the fourth chapter discusses the resulting assessment of abilities based on document types and processing demands. The fifth chapter compares the performance of selected subgroups, classified by factors including socioeconomic status and educational level. The final chapter draws some conclusions about ways in which literacy levels can be increased, and a brief epilogue puts the current literacy situation into a less than catastrophic perspective. Several pages of notes and references are appended. (HTH)

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The Subtle Danger

Reflections on the Literacy Abilities of America's Young Adults

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U.S. DEPARTMENT OF EDUCATION
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January 1987

Center for the Assessment of Educational Progress, Educational Testing Service
Report No. 16-CAEP-01

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This report, No. 16-CAEP-01, can be ordered from the Center for the Assessment of Educational Progress at Educational Testing Service, Rosedale Road, Princeton, New Jersey 08541-0001.

Library of Congress Catalog Card Number: 86-083272

ISBN 0-88685-060-6

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Foreword

I welcome the thoughtful discussion that this publication provides. Grossly insufficient literacy skills do, indeed, pose a "subtle danger," as the authors title their report. Deficient literacy skills, like high blood pressure, are unseen. But high blood pressure, as we are constantly warned, kills. Low-level literacy, and worse, outright illiteracy, kills opportunity, and if left untended, can kill the nation's economic prospects as well.

Last September the nation was duly warned in the report, *Literacy: Profiles of America's Young Adults*, released by the National Assessment of Educational Progress, administered by Educational Testing Service. NAEP tested a national sample of some 3,600 young adults and concluded that "their literacy levels are limited, stifling individual and national potential in our increasingly technological society."

We are not facing widespread, outright "illiteracy." The overwhelming majority of America's young adults "are able to use printed information to accomplish many tasks that are either routine or uncomplicated." But if we are to compete in the technologically sophisticated trade arena of the future, we will need a work force with a literacy level well above the mere ability to carry out "routine and uncomplicated" tasks.

My desk in the Department of Labor, day in and day out, has on it the problems of the one in four students that dropped out, or of those awarded diplomas who may be barely able to read them. The authors of this report, commissioned by ETS's Center for the Assessment of Educational Progress, have looked more deeply into the implications of this literacy data, and particularly from the standpoint of unemployment, economic competitiveness, the problem of poverty, and the inequality among subgroups in the population.

They point out that literacy demands are rising, and it is in that context that we must look at performance. After careful reanalysis, they conclude that "we are not a nation of careful readers nor are we highly competent information processors." As did the authors of the first report, they concentrate on the distinctions between just being able to decode the printed word, which almost all can do, and get to the important part: the ability to perform real-life tasks described in print...the ability to "process information." They point out how this may differ from the reading skills that are taught in school, and the kinds of changes in instruction that may be necessary.

Literacy gave us the facts that had not previously been available. *The Subtle Danger* provides a thoughful analysis that should stimulate the search

for solutions—and willingness to apply them. It must be more than an abstract discussion, and it will be concrete if we keep clearly in mind the danger and problems we face:

- A 25 percent dropout rate (staggeringly higher in inner cities and among minorities) that has been stuck for almost 20 years.
- School-based reading and math instruction that does not equip for real-life tasks.
- Unequal distribution of literacy skills that perpetuates inequality of opportunity.
- Dislocated workers who do not have the literacy skills to be retrained for the jobs that are available.
- Young adults employers won't hire.
- Declining ability to compete successfully in world markets.

The conclusions here presented can help us get from facts, to analysis, to solutions...to action.

ROGER SEMERAD
Assistant Secretary of Labor

Preface

In 1984, the National Assessment of Educational Progress was funded by the U.S. Department of Education's Office for Educational Research and Improvement to assess the literacy abilities of young adults, ages 21-25. Under the direction of Dr. Irwin S. Kirsch, the assessment was planned and implemented in a period of 18 months. On September 24, 1986, the major findings of the survey were announced in a press conference in Washington, D.C., and a technical and summary report were released. During the summer of 1986, as the first draft of the final report on the survey was nearing completion, NAEP invited the three authors of the present monograph to review the results and to draft a document that would spell out the implications of this assessment for America. The motivation for this invitation was a desire on the part of Educational Testing Service, which administers NAEP, to disseminate assessment results as widely as possible and to relate them to policy issues.

The three months during which we worked proved to be an exceedingly short period for three persons with different backgrounds to digest the methods and outcomes of such an important and complicated study and to extend these outcomes intelligently to education, labor, and citizenship in a highly complex and rapidly changing society. Nevertheless, with the generous assistance of the ETS staff we were able to obtain further analyses of the assessment responses and to receive expert advice on technical aspects of the assessment design and analyses. For this assistance we extend our gratitude to the ETS staff, and in particular to Dr. Irwin Kirsch and Ms. Ann Jungeblut.

The views presented here might, with further time and effort, be more refined rhetorically and more fully supported by linkage to relevant research in a variety of fields. Nevertheless, these views are the studied opinions of the three authors about the implications of what we feel is the most important assessment in this century of the literacy abilities of young adults. We are releasing this report now because we feel it is urgent for serious debate to begin on the issues raised by the assessment and for national and local attention to be paid to the literacy problems of young adults. No less than the nation's future—economic, political, and social—is at stake.

R.L.V.
C.F.K.
A.M.S.

1. Orientation

> *The scientific or literary well-being of a community is to be estimated not so much by its possessing a few men of great knowledge as its having many of competent knowledge.*
>
> —Horace Mann, 1867, p.315.

The NAEP Young Adult Literacy Assessment is an important study that has far-reaching implications for American society. It was planned and executed more carefully and more thoroughly than any literacy study of the past, yet it continues a direction of literacy assessment that began in the 1940s and has developed continually to the present time. Results from the present study show a wide distribution of basic literacy skills, but a severely constrained distribution of higher level ones.[1] The study also finds that literacy abilities of people 21-25 years-old are unequally distributed by race and ethnic origin, and by socioeconomic status, with many minorities and low-income adults demonstrating disproportionately low abilities. Unless improvements are made in American education, the labor force will become progressively less capable of doing highly skilled work as the proportion of poorly educated, low-income workers increases throughout the remainder of this century. Perhaps more important, the present inequalities, if not ameliorated, could lead to a society more deeply divided along racial and socioeconomic lines, with the number of low-income, low-achieving persons increasing from year to year.

Results from the study also show that the popular debate over how many illiterates there are in America is misguided and therefore that some current literacy initiatives may be misdirected. Literacy is not an all-or-nothing state, like smallpox or pregnancy. It is instead a continuum of skills that are acquired both in and outside of formal schooling and that relate directly to the ability to function within society. Almost everyone has some of these skills, but the issues of pressing national concern are (1) whether the labor force has the levels of literacy required to achieve desired living standards and competitiveness in world markets, and (2) whether people have sufficient levels to function as equal citizens within an increasingly technical society.

In this document we summarize the most important results of the Young Adult Literacy Assessment and discuss their implications not just for such immediately relevant concerns as the labor market and education, but also for those more general concerns of society such as citizenship and equality. A democracy requires a well-informed citizenry for its survival and well-being, and every citizen within a society requires information for participation and personal advancement within that society. However else we might characterize the modern age, it is unmistakably an age of print. Even with 725 television stations and almost 6,000 radio stations, print remains the primary medium for distribution of information in education, business, recreation, and almost every other facet of modern life.[2] Literacy is necessary for obtaining access to this information and effectively utilizing it, but not just basic literacy. Like some earlier studies, this one shows that literacy has many components and that different reading situations often require different literacy skills. We have yet

"Unless improvements are made in American education, the labor force will become progressively less capable of doing highly skilled work as the proportion of poorly educated, low-income workers increases throughout the remainder of this century. Perhaps more important, the present inequalities, if not ameliorated, could lead to a society more deeply divided along racial and socioeconomic lines, with the number of low-income, low-achieving persons increasing from year to year."

to determine completely what these skills are and how they relate to each other, but the present study offers a valuable contribution to our understanding of this issue and provides a methodology for pursuing it further.

This report is not a replacement for either the summary report or the final report; we strongly encourage all who are interested in the study to savor and digest those documents.[3] Instead, this is a reflection upon these reports, aided by the data generated from the survey and by the insights and explanations of the project director and the NAEP staff. We would not have undertaken this task if we did not believe that the survey was reliable and the results of national import. But these attitudes and the continuing assistance of the NAEP staff have not dulled our critical capabilities nor blinded us to the limitations of the assessment and its analyses, as even the more casual reader can discern within our discussion and recommendations. We don't ballyhoo these criticisms, however, because we find the results of the survey sufficiently convincing, and their implications so serious, that a sense of proper proportion requires that we focus on interpretations and not on blemishes.

Defining Literacy

In the Young Adult Literacy Assessment, literacy is defined as

> *Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.*[4]

By this definition, literacy implies an ability to *do* something, as opposed to a knowledge *of* something. Unlike the recall of facts such as the expected lifespan of the tortoise or the name of the tenth president of the USA, literacy involves a process for using printed materials in everyday situations. Literacy requires reading, but it also requires many abilities beyond the traditional, school-based definition of reading. Reading, as it is taught in the elementary schools, is typically defined independently of other communication skills, consisting of subskills like word recognition and comprehension.[5] Most instruction in reading is built around narrative texts, with the primary goal being for the reader to comprehend the author's meaning.

In contrast to this, literacy assumes as its goal the ability to use print to function as a member of society. Participating in local and national government, providing and utilizing civic and social services, working in a remunerative position, instructing one's children in the home, and individual self-improvement are among the functions in which literacy skills are required today.

In a survey of tests of adult literacy, Nafziger et al. concluded, "Literacy, in contrast to reading, implies both reading skills and socially appropriate reading behavior . . . "[6] Similarly, Gray defined functional literacy as abilities needed "to engage in those reading and writing activities normally expected of all literate members of a community."[7] *Literacy* and *reading*, however, are not in opposition. *Reading* is a basic ability, like distinguishing different colors, and just as color discrimination must be combined with certain motor activities to stop a car for a red light, so must reading be combined with other

abilities to write a letter requesting a job interview, or to decide which size of a particular cereal box is most economical to purchase for a large family.

Interacting with print may require writing, speaking, listening and some logical/mathematical ability, along with reading. Filling out a job application, writing a letter explaining why your child was absent from school, and explaining a posted work regulation to a co-worker all involve literacy skills. And so do filling out a checkbook stub, recording an address heard on the radio, and interpreting a bus schedule. How well every individual will do on these tasks cannot always be predicted accurately from reading ability as measured by most standardized reading comprehension tests. In other words, becoming proficient in any one literacy domain does not automatically imply proficiency in all other domains.

The view stated earlier of literacy as a continuum of communication skills is not unique to the present study. For example, a 1957 UNESCO report, *World Illiteracy at Mid-Century*, stated:

> The first problem to be met in counting illiterates is to define what is meant by illiteracy. As a matter of fact, literacy is a characteristic acquired by individuals in varying degrees from just above none to an indeterminate upper level. Some individuals are more literate or less literate than others, but it is really not possible to speak of literate and illiterate persons as two distinct categories. Nor is the problem solved by introducing a third category, semi-literates, placed between the literates and illiterates.[8]

Literacy, therefore, is not simply reading, or reading plus writing, but an ability to use print for personal and social ends. It is a functional skill in that it requires the application of various skills in common, everyday situations. In this sense, the phrase "functional literacy" is redundant in that literacy, by definition, is a functional ability. Literacy is also a continuum of skills, not an all-or-none ability. One can define arbitrary levels of performance for designating discrete literate or illiterate categories, as is often done in national surveys, but this obscures the true literacy issue, which is what people can do and how these abilities relate to particular social needs. The arbitrary designations are also misleading in that they frequently are used to generate quantitative estimates of "illiterates," whose numbers provide little guidance as to the nature of the problem or the types of literacy instruction needed.

"Literacy, therefore, is not simply reading, or reading plus writing, but an ability to use print for personal and social ends. It is a functional skill in that it requires the application of various skills in common, everyday situations."

How Much Literacy is Enough?

Education is a necessity for the survival and well-being of a democratic society. According to Thomas Jefferson, education has three purposes in a republic: "to prepare some citizens to be public leaders, to enable all citizens to exercise the common rights of self-government, and to ready all citizens for the pursuit of happiness in the society's private sphere."[9] Education that meets these ends varies according to the country's state of development. What was required for citizenship and individual advancement in 1804 was different from what was required in 1904 or what will be required in 2004.

The main literacy problem, over the long run, has not been that people's literacy skills have been slipping, but that literacy demands keep rising. This is a process that has been going on at least since the invention of the printing

press. In early modern Europe, mass literacy campaigns were aimed at preparing ordinary people to read scriptures aloud. Only a few familiar texts were used—generally a Bible and a catechism; interpretation or application of knowledge to new contexts was limited; and writing was not emphasized.[10] In the nineteenth century, many nations, including the United States, added nationalism and civic participation to the aims of literacy, thus producing a more secular agenda. Literacy materials then included a wider variety of texts within a school curriculum that had already expanded to include writing and arithmetic, among other subjects. Still, understanding was not so important as rote mastery, and problem-solving was not a central goal. In the twentieth century, school attendance became almost universal, graduation from high school became the majority experience, and a profusion of publications sprang up around a widely literate population. In countries like America, the goals of literacy had escalated again: Educators and employers wanted more people to have advanced reading skills, larger reading vocabularies, and the ability to use new information in complicated ways.

Today, the good news is that Americans' literacy skills have generally expanded in response to new demands and possibilities. The bad news is that demands often seem to outstrip attainment. Periods of imbalance between needs and attainment have often led to a sense of educational failure and to anxieties about the social and economic consequences of literacy shortfall. We have been in such a period off-and-on for the past 30 years or so.

Even without the results of the present assessment, it is clear that there is a compelling need for higher levels of literacy skills in our society, whether most jobs require them or not. If work is to be more fulfilling, if worker productivity is to increase, and if we are to have more democracy in the workplace, we need workers schooled in critical reading and accustomed to independent problem-solving. A high level of participatory democracy is difficult in a mass technological society, with its large corporations, its dedication to expertise, its complex legal system, and its complicated government programs. If we expect to have both intelligent participation in American democracy and the fruits of large-scale institutions, critical thinking and reading skills must be acquired by all groups in our society. Which literacy skills have been acquired by young adults and how these skills distribute across population subgroups are the main focus of this report.

Schooling and Education

Education is partially defined through schooling practices, but schooling and education are not identical. A literacy survey done by the U.S. Department of Commerce in 1969, for example, found that 43 percent of those in the U.S. who had no formal schooling could nevertheless read and write a simple message.[11] The present study shows that apart from schooling, literacy abilities improved with practice.

Education can be derived from family instruction; from self-study; from observations made during travel; from newspaper, magazine, and book reading; from radio and television listening and watching; and from a variety of other activities. Education within formal schooling has developed into a highly structured process by which subjects and curricula are well-defined.

Reading materials for each subject are specified, lessons and tests given, and practice allocated. In contrast, education outside of formal schooling tends to be more unstructured, requiring students/citizens to select, attend, and assimilate on their own.

Any survey of skills possessed by people 21-25 years old will tap the effects of informal as well as formal schooling. Therefore, this study has implications not only for public schooling, but for other educating arrangements: on-the-job training; classroom training programs for the unemployed and the economically disadvantaged; educational TV; professional lectures, workshops, and seminars; and others. While we see clear implications for the elementary and secondary school reading programs, we also see implications for these other institutions which are, for many citizens, the only sources of programmatic education after secondary school.

Organization and Conclusions

In this report, we focus not only upon the educational implications of the NAEP Young Adult Literacy Assessment, but also upon its implications for labor and citizenship. Our strategy is first to create a context for the assessment by sketching the historical roots of literacy and literacy assessment in America (Section 2). Then, we outline the methodology and reporting scheme of the assessment (Section 3), the findings on specific literacy abilities (Section 4), the findings on the relationship of literacy abilities to respondents' background characteristics (Section 5), and finally, implications for education, employment, and citizenship (Section 6). The materials presented in Sections 4 and 5 are derived both from the Summary and Final Reports issued by NAEP and from additional analyses done specifically for this report. Although we did independent analyses of many issues, and have adopted a different organization of the assessment items from that of NAEP, our results present converging rather than diverging evidence for the conclusions presented in the Summary Report.

Our conclusions, echoed throughout this report, are that the literacy skill levels found in the NAEP survey are not adequate, on average, for maintaining world leadership in a changing, technological society at the end of the twentieth century. America's labor market, its military, and its political and economic processes require citizens with relatively high levels of critical thinking/reading skills. The continuing process of economic and social change which America has experienced at least since the end of World War II, and which most certainly will continue through the remainder of this decade and probably the next, requires citizens who can adapt to change, whose literacy skills allow them to master new jobs, new economic structures, and new political structures.

Not only were general skill levels low relative to the needs we perceive, but the levels achieved by many minority and poor respondents were disproportionately low, even when background and educational factors were controlled. Long-term programs that focus on critical reading/thinking skills, but skills different from those now emphasized in elementary and secondary reading programs and in job-specific occupational training are needed to remedy this situation. This survey demonstrates that what is taught currently

"The solution we advocate is *not* to build the elementary and secondary curriculum around tax tables, advertisements, and such, but to develop, through instructional experimentation, a curriculum that teaches the underlying skills and strategies required by everyday literacy tasks, and to extend this education to nonschool agencies: job training, government programs for the unemployed and the poor, television, and the like."

does not transfer well to everyday literacy demands. In particular, the present-day, literature-oriented school curriculum, with its concern for text structures and reader background knowledge, is not sufficient for ensuring the acquisition of the problem-solving skills that critical literacy requires. Literacy tasks deriving from the use of bus schedules, tax tables, almanacs, and advertisements can be as complex and as demanding of critical reading/thinking skills as literacy tasks built around narrative and expository writing. The solution we advocate is *not* to build the elementary and secondary curriculum around tax tables, advertisements, and such, but to develop, through instructional experimentation, a curriculum that teaches the underlying skills and strategies required by everyday literacy tasks, and to extend this education to nonschool agencies: job training, government programs for the unemployed and the poor, television, and the like.

The problems of those lacking even the most basic literacy skills—those often labeled as "illiterates"—will continue to merit national attention. But the literacy needs of those above this bottom level are a problem of far greater dimension, one that will require federal, state, local, and private assistance to overcome. Short-term solutions aimed at "overcoming illiteracy" or preparation for a narrowly defined military or civilian position will not augment America's human capital as effectively as long-term solutions based on teaching adaptable skills. For many of the poor, for many minorities, and for those with minimal schooling, literacy needs are only one of a complex of problems, and no single program will solve them all. But improvement of literacy skills is a necessary step for eventually allowing every American to participate fully in society.

2. Literacy and Literacy Assessment in America

I think by far the most important bill in our whole code is that for the diffusion of knowledge among the people . . . Preach, my dear Sir, a crusade against ignorance.

—Thomas Jefferson, 1786
(cited in Lee, 1961, pp. 99f)

The literacy skills of America's citizens have continually expanded, from the days of the American Revolution to the present. And yet we believe that the strategy that produced this expansion—more schooling for more people—may now be insufficient. The demand for higher levels of literacy constantly rises in a society that is both democratic and highly technical. The present moment in America's development requires a new escalation of our expectations, and simply providing more of the same kind of schooling will not produce the skills we need. This moment also requires changes in schools and changes in educational efforts outside of schools. In arguing this point of view we believe that a historical perspective is useful. Thus, in this section, we highlight some historical trends in the attainment and measurement of literacy in America.

Literacy in Early America

In early America, literacy usually began at home, with the help of parents, siblings, other relatives, and servants. Schooling was used as a supplement, or as a substitute for parents who could not provide literacy training, and for higher subjects, like writing and grammar. Even when Jefferson called for a "crusade against ignorance" in the early republic, most communities favored a distinctly minor role for their district schools, with their short sessions and modest academic expectations. Of course, literacy skills did not depend solely upon schools. Traveling missionaries tried to reach the poor and the unbelievers through Bibles and tracts; skilled artisans developed a culture of self-improvement through reading; and Americans of the middling ranks patronized lyceum lectures, libraries, and the ever-cheaper newspapers.[12] But despite such widespread reading activities, the nineteenth-century free school became the chief means of teaching basic literacy, and areas that reported high rates of basic literacy generally had high rates of school enrollment. School attendance rose and access to schools increased, especially for females. White women's literacy rates caught up to men's by 1860. In addition, the almost universal enrollment of White children from all classes and ethnic groups, for at least a few years of schooling, meant that—for those in public schools, at least—the state could promote a common culture and a common set of values through elementary schooling.

While the increasing association of education with schooling gave the

public school enterprise tremendous potential, it also imposed certain limitations on the content of literacy. The basis of the schools' common culture in the nineteenth century was Protestant, Anglo-Saxon, and middle-class. Children from other groups may have been well-served by the schools' culture and values in some ways; yet periodic complaints about the cultural biases of the schools underscore the point that literacy is not neutral, and school literacy is not all literacy. In the past few decades, American schools have attempted to broaden the cultural base of schooling while still promoting a common core of knowledge and skills—a necessary task of immense difficulty.

"A second limitation of school literacy is that the reading curriculum has acquired a particularly literary bent."

A second limitation of school literacy is that the reading curriculum has acquired a particularly literary bent. The outright moral homilies of the McGuffey readers gave way to character-building through exemplary literature. The public schools stood for the defense of high culture; in reading, high culture meant literature. The curriculum eventually became preoccupied with literary concerns like plot, characterization, and poetic structure. It was relatively unconcerned with nonfiction and the skills needed to use prose texts effectively in adult roles.[13] A popular reading text of the 1890s argued, for example, that by the sixth grade children should "devote more and more attention to literary criticism," to learn "what are the best books and why they are so considered."[14] In the twentieth century periodic interest in teaching expository skills and study skills has not altered this bias. Equating literacy with schooling, then, narrows our concepts of both the content and skills of literacy as it functions in the society.

Another consequence of equating literacy and schooling is that every perceived weakness in the academic abilities of youth and young adults is cause for pillorying the public school system. Although there are weaknesses in the literacy programs of the elementary and secondary schools, the weaknesses revealed by the Young Adult Literacy Assessment cannot be remedied by improvements in public schooling alone. Education, as opposed to schooling, is a lifelong activity that derives from efforts of the home, school, media, workplace, and other local and national resources. To advance the literacy skills of young adults will require the combined efforts of all of these institutions—with parents, industry, national and local government, the schools, and the media assuming major responsibility for fostering a cultural emphasis on continued learning and self-improvement and providing economic rewards for the attainment of such skills.

The Measurement of Literacy in American History

When Joseph Mayer Rice began his famous school surveys in 1892, he tested reading with the following method: "I conducted the observations in such a manner as to be assured of hearing pure sight reading. I accomplished this by taking with me into the class-room under observation not more than one or two copies of a book that the pupils had never before used. These books were passed from child to child, no opportunity being given to the pupils even to look over the matter before reading it aloud."[15]

Literacy assessment procedures have become more sophisticated since Dr. Rice's day, and there is now no shortage of literacy studies. Why, then,

another study? What does the NAEP Young Adult Literacy survey offer that has not already been said in the host of reports, surveys, position papers, and other writings that have been published on this topic? To answer these questions, it is necessary to review briefly the history of literacy assessment in America and the changing concepts of literacy and illiteracy.

Today, relatively few people are utterly illiterate, so it makes little sense when thinking about policies to divide the society into just two camps—the literate and the illiterate. But in a society where many people were unable to read at all, it made sense to think of literacy problems in terms of the percentage of people in various groups who were outright illiterate. According to the Oxford English Dictionary the term "illiteracy" appeared as early as 1660 and has apparently been used continuously since that date. "Literacy," on the other hand, does not appear in print until 1883. For a long time, then, measurement efforts focused on the number of people who were illiterate, as they still do in less developed nations. In America, the government's interest in gauging the extent of illiteracy dates back to the U. S. Census of 1850. For almost a century, the census takers simply tabulated the literates and the illiterates without reference to the level of skills involved. Nor did the Census Bureau give actual reading performance tests, the census takers just asked people if they could read and write.

The 1860 census reported that 90 percent of White females said they could read and write, compared to 93 percent of White males.[16] The availability of common schools, along with arguments for female education, had nearly closed the gender gap in rudimentary literacy. With most White women incorporated into the elementary education process, attention shifted to the rudimentary literacy skills of other visible out-groups in American society. In 1860, among free Black Americans, 64 percent said they could read and write. But in 1870, when former slaves were added to the free Black population, the self-reported literacy rate fell to only 19 percent. Considering the forces of poverty and discrimination stacked against Black Americans, it is a testimony to their efforts on their own behalf and the premium they placed on literacy that over the next 50 years, the self-reported basic literacy rate for Black Americans climbed to more than 70 percent. The rate for White European immigrants was higher than that but lower than the White native rate. The mounting concern over immigrant illiteracy dramatizes the fact that in the minds of native-born White Protestants, literacy was not just a skill. It was a tool of assimilation. Thus, reports about immigration often conjured up fearful images of illiterate immigrants, unaccustomed to the American political system, dependent upon foreign newspapers and fettered by foreign loyalties. "A mighty army is this," said a Department of Education study in 1913, referring to the estimated 5.5 million illiterate immigrants, "with their banners of blackness and darkness, and hopelessness—too large for the safety of our democratic institutions."[17] Congress imposed a literacy test for entrance to the country, while states passed various laws restricting the teaching of foreign languages—anxious responses to the tremendous volume of European immigration into the United States in the decades preceding World War I.

During the 1920s, the emotional edge softened somewhat on the subject of illiteracy. The Census Bureau reported that the self-reported literacy rate of

native-born White Americans was over 96 percent. At the same time, Black literacy was about 77 percent, up from 70 percent in 1910, and the literacy rate of foreign-born White Americans, remained roughly constant at 87 percent. Immigrant illiteracy had been sustained by a continuing flow of new immigrants, but that situation would soon be alleviated by restricting immigration itself.[18] Still, the highly publicized and widespread failure of Army recruits on entrance tests during World War I suggested that the census figures either represented too low a standard or were too distorted by false responses. "It is obvious," said a 1919 magazine editorial, "that the test applied in the camps was for practical purposes a real test, whereas a vast amount of the literacy that 'got by' for census purposes was merely nominal."[19] Americans began to realize that the census literacy figures they had previously considered an index of educational progress masked serious deficiencies in low-level reading skills, and the problems were not confined to Black Americans and immigrants.

This set the stage for a shift of emphasis in public pronouncements about literacy. Reading experts and policymakers began talking about the large numbers of people who were literate in a technical sense but didn't read very much or couldn't read very well. To call these people "illiterate," one leading test expert admitted, "is to use the term 'illiteracy' in a very different sense from the usual usage."[20] Nonetheless, the Census Bureau stuck to its traditional policy in 1930, simply asking people if they could read and write in any language. This resulted in literacy rates of about 97 percent for White Americans, 90 percent for the foreign-born, and 84 percent for Black Americans. But William Gray, who was emerging as the leading student of Americans' reading abilities, challenged the census rates as too high. He noted that 20 percent of the population could not read newspapers, and he urged funding for functional literacy training in the intermediate range as well as initial literacy training.[21]

At this point in the history of American literacy, people began equating "functional" literacy with a certain grade-level of formal schooling. This practice ignored two basic facts. First, by definition, half of the students do not read at the average ability level for the grade they have completed. Second, functional reading tasks outside the school setting are often different in function and different in their conceptual demands from the reading tasks measured on school reading tests. As a result, reading grade levels often don't correlate well with success at reading tasks outside of school. Nonetheless, the trend toward defining functional literacy by grade level shifted the focus of literacy discussions to a new and larger group of readers. It upped the ante: The label "illiterate" was now applied to all who had not received a certain amount of schooling and therefore were presumed to lack the reading abilities necessary for competent reading in the daily life of the average American. To the Civilian Conservation Corps, which ran literacy programs in the 1930s, the standard was a third-grade education. For the Army in 1940, it was fourth grade. For the Census Bureau, in a 1947 study, it was fifth grade, then in 1952, sixth grade.[22] Recently, some have called for an eighth-grade definition of functional literacy, and some even for a twelfth-grade standard.[23]

In the 1970s, researchers began to emphasize that functional literacy was not just a grade-level ability to be established by comprehension tests, but a

complex of abilities that required different reading skills than those taught in schools.[24] Survey researchers began to test people directly for their ability to read bureaucratic forms, instructions, and advertisements that are encountered in most adults' lives. These studies tended to suggest bigger literacy problems than census figures had earlier suggested, but the contents of each test differed and each specified different criteria for establishing illiteracy.

The first of the 1970s surveys was prepared by Louis Harris and Associates, who were selected to determine the level of functional literacy in this country by the committee appointed to oversee the Right to Read campaign. In the Survival Literacy Test, adults were asked to fill out five different forms: a social security number request, a bank loan application, a driver's license application, a public assistance form, and a Medicaid form. People who got fewer than 70 percent of the answers correct were called "low survival" functional illiterates; those who answered more than 70 percent but fewer than 80 percent correct were called the "questionable survival" group; and those who got between 80 and 90 percent correct, the "marginal survival" group. On the easiest form, the application for public assistance, 97 percent of the test subjects got more than 90 percent correct; on the hardest form, the Medicaid application, only 64 percent got a 90 percent grade—the "likely survival" functional literacy category.

Overall, Louis Harris and Associates calculated that 3 percent of the population was below the "low survival" threshold, another 5 percent was below the "questionable survival threshold", and another 5 percent was below the "marginal survival threshold," for a total of 13 percent considered functionally illiterate.[25] In calculating a summary of the whole test, Harris testers averaged the percent in each functional literacy category for the five forms, rather than calculating a composite score for each test subject, thus the Harris estimates may overstate the degree of so-called "functional illiteracy."

On the other hand, critics said that some of the forms on the test were easier than the real-world forms used for the same purposes and that one form required special background knowledge not ordinarily carried around in one's head.[26] These criticisms illustrate the difficulty of devising tests that usefully summarize people's abilities in real-world literacy tasks.

In any case, Louis Harris and Associates had a chance to try again the next year, when the National Reading Council asked them to measure additional types of practical reading tasks and develop a general index for rating reading difficulty. In what they proudly announced as a "benchmark" in literacy measurement, Harris testers developed an index of difficulty based on 59 items from reading tasks such as reading a telephone book, understanding a classified ad, or completing an application form. As a result of their study, they concluded that 4 percent of the adult population had "serious difficulties" in functional reading skills, and another 11 percent had to make "serious efforts to respond to the printed word in real-life situations."[27]

The two Harris studies—Survival Literacy and Reading Index—set the direction of 1970's functional literacy tests and, although the news from these surveys did not seem disastrous or too surprising, worse news was on the way. The Adult Functional Reading Study of 1973, conducted by Educational Testing Service, did not join in the quest for a single number of functional illiterates, but 18 percent of its subjects, on average, were unable to answer

the items that dealt with "maintenance," like signs, schedules, and recipes. About 25 percent, on average, missed items from the occupational setting, such as sick-leave policy and employment information.[28] The Mini-Assessment of Functional Literacy, commissioned by the National Right to Read campaign and conducted by NAEP in 1974 and 1975, looked only at 17-year-olds in school, finding that even in this group, about 13 percent performed below the "minimally acceptable" level of 75 percent correct on tasks involving store coupons, road maps, insurance policies, and report cards.[29]

These tests of functional literacy shared three characteristics. They attempted to select representative reading tasks encountered in most people's adult lives; they did not attempt to analyze or explain what it was about the particular items that made them difficult; and, except for the Adult Functional Reading Study, they averaged scores on the different tasks in an attempt to create a single scale and then set rather arbitrary success criteria to give a composite picture of functional literacy in the society. The net effect, it seems, was to impress upon the American public that many adults could not effectively read items that others considered routine and necessary and, furthermore, that there were dramatic differences among racial and income groups, with troubling implications for both social justice and the future productivity and flexibility of the work force.

With these tests as a backdrop, much attention was paid to the Adult Performance Level Project conducted in the early 1970s by the University of Texas and funded by the Office of Education. Although a rather hybrid test was used, the results of this project, released in 1975, have received enormous publicity. Test subjects were asked to read and respond to many of the same kinds of documents that were included in earlier functional literacy tests—road maps, insurance policies, product labels, pay statements, and the like—but the test also required considerable background knowledge and skills beyond document literacy, and it claimed to measure, not functional literacy, but adult "functional competency." Within the final report are several straightforward examples of results on individual items: 83 percent could calculate deductions on a pay stub, 67 percent could calculate total gross pay from a pay rate, 71 percent could calculate yearly take-home pay when given monthly gross pay and deductions.[30] But the results that got the most publicity were those for summary categories devised by the testers. On the basis of criteria never made explicit, the authors established three categories for general adult functional competency: to Level I, the "least competent adults," they assigned 19 percent of the population; to Level 2, the "marginally competent adults," they assigned another 34 percent, leaving only 46 percent in the "most competent" category. It was the combined figure of Categories 1 and 2, or 54 percent incompetent, that Secretary of Education Terrel Bell applied to the 1982 population in advising Congress that 72 million Americans' functional literacy was doubtful.[31]

The 1970s estimates of functional illiteracy ranged from 15 percent to over 50 percent of the American population. Reactions ranged from urgent concern to indifference. Still, it was a time of economic stagnation and declining school achievement scores. Some observers talked about an educational crisis, and the functional literacy tests reinforced these con-

cerns.[32] Some people continued to talk about functional literacy as if it were a target grade-level of reading ability, but everyone knew that there were more direct ways to study functional literacy in adult settings. In keeping with this insight, the 1970s saw studies detailing the differences between school and non-school literacy[33] and studies of reading on the job.[34]

By the end of the 1970s, functional literacy studies had underscored the importance of measuring reading ability on different real-world tasks. Still, much confusion remained. Not only did the studies produce varying estimates of illiteracy, but each single report contained estimates that differed, depending on which cut-off point was used. Furthermore, each report had its critics, arguing that its estimate was too high or too low once other factors were considered—practice effects, fatigue, sampling problems, selection of test items, conceptualization of literacy, or other flaws. As we shall see, the Young Adult Literacy Assessment that prompted this monograph tried to escape these problems, not by finding a better way to give a summary estimate of functional illiteracy, but by emphasizing the multiple nature of literacy skills and by reporting profiles of people at different skill levels on different kinds of tasks.

'Not only did the studies produce varying estimates of illiteracy, but each single report contained estimates that differed, depending on which cut-off point was used.'

3. Assessing the Literacy Skills of Young Adults

Experience has taught that before desirable reading habits can be established on the part of many young people much information is needed concerning their present reading activities and the influences that have determined their development.

—Gray & Munroe, 1929, p.3.

While the Young Adult Literacy Assessment provides the most refined analysis ever made of the literacy skills of people 21-25 years old, its methods and its results are complex, and further analyses and interpretations may be needed to evaluate fully its findings. Nevertheless, we can already draw some general implications of this study for efforts to achieve economic and social-justice goals, for citizenship, and for education.

Sampling Methods

Before summarizing our interpretation of the results and the consequent implications of this study, we want to clarify both the methods of the study and the approach we have taken to reporting the most important findings. This study is a survey of the literacy skills of people 21-25 years old, sampled from the 48 contiguous states, but excluding those individuals who were not living in private houses or apartments (e.g., inmates of institutions, military personnel living on bases). Although one suspects that some of these excluded groups might score lower on literacy tests than those sampled, recent studies of the abilities of military personnel show that members of the armed forces in the age range 21-25 have about the same level of literacy skills as the general population at the same age levels.[35] For prisoners and inmates of other institutions, we have little comparative data, although what is available indicates significantly lower reading abilities for prisoners than for the general population. However, the proportion of people ages 21-25 who are in correctional or health institutions is so small that this omission could not have a major influence on the study outcomes.[36]

In short, we agree with the authors of the study that a nationally representative sample of young adults was tested and that in spite of some sampling problems the survey results can be projected reliably to the entire 21- through 25-year-old population. We might cavil with the age bracket selected, arguing that 19-26 or 18-30, or some other, wider range would have been more informative, but the data we have for 21-25-year-olds will remain valuable no matter how we argue. It is unfortunate, nevertheless, that the major literacy surveys done over the past 15 years have focused on persons in different age brackets. The NAEP Adult Work Skills and Knowledge Survey selected 26-35 year olds[37], for example, while the NAEP Mini-Assessment of Functional Literacy[38] assessed only 17-year-olds. In contrast, the Adult Performance

Level Survey sampled persons 18 years of age and older, Louis Harris and Associates (1970) sampled persons 16 years of age and older, and the Brief Test of Literacy, administered as a part of the Health Examination Survey, tapped ages 12-17.[39] Finally, the Census Bureau traditionally reports the age distribution of illiterate men and women in brackets that correspond to none of the above (14-24, 25-44, 45-64, 65+).

The sampling of young adults in this NAEP survey yielded representations of sexes, regions of the country, educational levels, employment statuses, and parental educational levels that were roughly proportional to the distribution of these characteristics in the full population of approximately 21 million 21-25-year-olds. To examine race/ethnicity differences more fully, Black and Hispanic Americans were oversampled. In reporting percentages correct for test items, responses are weighted to compensate for deviations of the sample subgroup proportions from those of the total 21-through 25-year-old population. Thus, the percentages reported here for items are actually estimated percentages.

Text Types

The survey itself consisted of two parts: A 105-item assessment of literacy abilities and a 123-item questionnaire that explored the respondent's demographic and socioeconomic characteristics, language background, reading practices, use of free time, educational history, recent work history, and other personal matters. The techniques for administering and scoring the two parts are fully described in the Technical Report and will not be repeated here.

The 105-item literacy assessment was composed of a wide variety of items that assessed abilities to extract and use information from print. These exercises were selected to represent typical written materials (i.e., texts) and typical processing demands (i.e., tasks) of young adult life. Within this text-task design, varying levels of difficulty were created, primarily by varying task complexity. No attempt was made to use current models of reading comprehension or to scale texts by traditional readability formulas. The original design designated 12 categories for materials. To simplify discussion, we have grouped the materials actually used into four classes: prose and poetry; tables, graphs, charts, and maps; entry forms; and miscellaneous texts.[40]

Prose and Poetry: These were, with the exception of two brief poems, expository selections of connected prose, ranging from 100 to 400 words each. Several were newspaper articles, reprinted by permission, and some were passages from the 1983-84 NAEP Reading Assessment.[41] All were coherent, continuous prose, composed of sentences grouped into paragraphs.

Tables, Graphs, Charts and Maps: These were bus, airline, and TV schedules; menus and indexes; almanac and tax tables; bar and line graphs; street maps; and other familiar structures that present the same basic data structures repetitively. Some involved numerical data with verbal labeling (e.g., schedules and tax tables); some involved verbal data with accompanying numerical fields (e.g., menu, index); and some used graphic representations with verbal identifications (e.g., graphs, maps).

Entry Forms: These were text structures which required entry of different types of data in specified fields. Included were a social security card, check and check ledger, catalog order form, phone message form, deposit slip, job application form, and room reservation form. The verbal components of these forms varied from full sentences to single words and phrases.

Miscellaneous Texts: These represented the flotsam and jetsam of our print environment, the text types that did not fit into the other three categories, such as ads, road signs, grocery labels, catalog pages, and wage and tax statements. Many of these have characteristics of the other classes; for example, some almanac entries mix continuous prose with repetitive lists and tables, and billing statements usually have lists of purchases with unique accompanying information (date of billing, amount due, etc.).

Processing Demands

The processing demands of the assessment items might be classed in a variety of ways. In the original assessment design, use of materials was divided into five categories: knowledge, evaluation, specific information, social interaction, and application. For the exercises that were eventually included in the analyses of the responses, we discern four major types of tasks: location or entry of facts, analysis of groups of facts, interpretation, and summarizing. In reviewing the results, however, two broad types of tasks emerged as especially important: informational processing and logical/mathematical processing. Our discussion of processing demands, therefore, focuses on these two classes.

Response Types

While some multiple-choice questions were used, the majority of the items required circling, underlining, writing, or speaking. This approach to assessment contrasts sharply with the traditional school-based test of reading comprehension. In school-based tests, comprehension is generally assessed through reading passages which require responses to multiple-choice questions about main idea, cause and effect, outcomes, characterizations, and other passage features. Although expository passages are often used, everyday literacy tasks, such as filling in an employment application form, are seldom required. The present study has assessed skills that extend beyond traditional reading comprehension to encompass applications of print-related abilities in the areas of work, citizenship, and recreation.

Administration

Each respondent answered nine core items, and, if three or more of the first seven of these were answered correctly, three blocks of 10-15 items each were also attempted.[42] Respondents who answered fewer than three of the first seven items correctly were given an oral language survey rather than more printed items. However, only 64 of the 3,474 English-language respon-

dents scored this low. Respondents who spoke Spanish but not English were given instructions for the core items in Spanish, but were not given any further written items. Respondents who did a full set of printed items were allowed approximately 60 minutes to complete them. Since this was a test with general time constraints, with the attendant anxieties that such situations often engender, one might argue that the test results underestimate true abilities. This might be true if speed were not a critical factor in literacy. But a competent reader must be both accurate and quick. Being able to puzzle out a short newspaper article, word by word, at a rate of 10-15 words per minute, is not sufficient competency, no matter what the accuracy rate, in a country where the average eighth grader reads grade-level materials silently at more than 200 words per minute.[43]

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Reporting of Results

Initial analyses of survey results required weighting of responses for each subgroup, as explained above, to yield a projected (or weighted) percentage correct for 98 percent of the population of people 21-25 years old and for each survey subgroup. (Two percent of the sample did not attempt the assessment items beyond the core, due either to low scores on the core items or language difficulties.) The resulting summary tables gave response percentages on each item for the total (i.e., 98 percent) population and for the following subgroups:

- Males and Females
- White, Black, Hispanic, and Other
- Section of the country: northeast, southeast, central, and west.
- Educational level: less than high school, some high school, graduated high school (and some postsecondary schooling), and college degree (two- or four-year).
- Parental education: less than high school, graduated high school, post high school.
- Employment status: full-time all year, part-time all year, full-time part of the year, part-time part of the year, unemployed, in school, or keeping house.

Our analyses of specific literacy abilities in the next section are based on these data.

Scale Scores

For comparison of results across subgroups, and for linking responses to other assessments, NAEP utilizes scale scores based on a scaling model that transforms percentages correct to continuous scales, based on latent dimensions.[44] Rather than reporting the percentage of respondents who responded correctly to a particular item, NAEP reports the percentage of respondents who are characterized by different scale points (0-500) based on their ability levels, and then attempts to define these points by the items that are most closely related to them according to an arbitrarily assigned 80 percent correct criterion. For example, the Summary Report states that 9 percent of the total

group scored at or above the 375 level on the prose scale, and that an item that has approximately this level of difficulty is one in which respondents read descriptions of benefits for two different insurance plans and explained orally their differences.[45]

What these statements mean is that only 9 percent of the total population of young adults scored at a competency level at which the probability of correctly answering the insurance question was at least 0.80. Groups of respondents who scored lower (e.g., 350, 325) have lower probabilities of doing this item correctly. Altogether, 47 percent of the respondents did the item correctly, yet by the NAEP scaling procedure, this item illustrates a competency level which only 9 percent of the population attained.

Four scales were employed for reporting the survey results: (1) the NAEP Reading Proficiency Scale, represented by 15 items selected from the 1983-84 NAEP Reading Assessment, (2) Prose, consisting of 12 items based on expository passages and poetry, (3) Document, consisting of 63 items based on ads, labels, charts, graphs, and the like, and (4) Quantitative, consisting of 15 items that required arithmetic processing. The NAEP Reading scale is used primarily to link young adult performance to 17-year-old, in-school performance, while the other three scales were developed for the assessment and are used to compare performances across subgroups. Scale scores are employed in our report for comparing subgroups defined by sex, region of the country, race/ethnicity, socioeconomic status, etc. In the section below, however, we have rearranged the items by document type and then by processing demands, and we simply report the percentage of respondents who got various items correct, to illustrate the extent of literacy skills revealed by this assessment.

4. Abilities Based on Document Types and Processing Demands

The literacy problem identified for the nation's young adults can be characterized in two ways: While the overwhelming majority of young adults adequately perform tasks at the lower levels on each of the three scales, sizable numbers appear unable to do well on tasks of moderate complexity. Only a relatively small percentage of this group is estimated to perform at levels typified by the more complex and challenging tasks.

—Kirsch & Jungeblut, 1986a, p.4.

This statement about the study's results is the most important finding of the assessment and the basis for the conclusions about the size of differences by educational attainment and race/ethnicity that follow in succeeding sections. If the general skill level of the young adult population had been found to be high relative to social needs, then differences across groups defined by educational attainment, race, or ethnicity might have been interpreted differently. But the major finding is that general ability is low, *relative to societal needs as represented by the survey items.* To examine this conclusion, we analyzed the results in terms of the text types and processing demands described in Section 3.

Prose and Poetry

Approximately 30 of the 105 items required the respondent to read an expository passage and respond to it in some way. When the response required identification of a single item of information and when the description of the information in the question and in the text were the same, or nearly the same, scores were high. Thus, over 95 percent of the projected population could match "...what Ms. C. ate." with "...C. had kept up her strength with 'banana and honey sandwiches,' . . . ", which occurred in a newspaper article about a marathon swimmer. When distractors appeared, or when multiple features had to be matched between question and text, scores were lower. For example, in the swimmer article, only about 87 percent of the respondents could identify correctly the age at which Ms. C. began swimming competitively. The text contains, besides the correct answer to this question (15), Ms. C.'s current age (23), and the current age occurs before the correct answer.

When the information requested could not be located in a single text sentence, but had to be gathered or inferred from several sentences or the whole passage, scores were even lower. For example, in a passage about the rescue of a mountain climber, 83.9 percent of the projected population could match the answer option "He had great physical and mental endurance" with the text statement "After 15 days on the mountain . . . he still had strength and

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will power." Yet, when asked to read an article about the electronic chip, only 57.9 percent could identify from a two-sentence paragraph which of four answer options was mentioned as potentially becoming widespread as a result of the personal computer. This item had a relatively difficult vocabulary (trifling, fleeting, iridescence, fragile, tangible, exotic, etc.) and complex sentence structures. In a multiple-choice question on the meaning of the word *trifling*, only 40 percent chose *insignificant* from a list of four options.

Mode of response did not make a difference across the prose items. For example, 96.3 percent could successfully fill in a job application form and 83.6 percent could successfully locate and copy from an almanac entry the names of three foods high in vitamin E. In other items, high scores were obtained through multiple-choice selection, underlining of a sentence, or composition of a sentence.

The more traditional classifications of *literal* and *inferential* comprehension were not helpful in predicting item difficulties. Some *literal* items, for example, were more difficult than some of the *inferential* items. These results closely mirror some of the results of the 1977-78 NAEP math assessment. "Although students could successfully identify which operation should be used to solve simple one-step problems, they had great difficulty analyzing nonroutine or multistep problems. In fact, given a problem that required several steps or contained extraneous information, students frequently attempted to apply a single operation to the numbers given in the problem."[46]

Tables, Charts, Graphs and Maps

Tasks involving bus schedules, menus, graphs, maps, and the like were not difficult, per se, for the young adult population. For example, 94.1 percent could locate a movie in a TV listing, given time and channel, and 92.0 percent correctly located the intersection of two streets on a map. But when a sequence of four directions had to be followed in moving from one point to another on a map, scores fell to 79.5 percent correct. Of moderate difficulty were a series of three questions requiring location of information from a telephone book yellow page. Percentages correct varied from 78.2 to 84.5 and did not seem to vary with the number of features involved or number of distractors present. But when multiple operations had to be performed, scores were significantly lower.

For example, 89.1 percent of the population could determine from a group of bar graphs which energy source is predicted to supply the most power (in three different years), but only 67.7 percent could answer a question involving multiple comparisons across these same graphs. Locating information in an almanac table and transferring it to a graph was exceedingly difficult, as was a comparison between two numerical entries in an almanac table.

Asking respondents to locate page numbers in the general index of an almanac revealed weaknesses in their problem-solving abilities. When asked to find a list of foods that contain vitamin E, 85 percent could locate the correct page under the index entry "Vitamins in diet, value." (There were no other "vitamin" entries in the index.) Scores were slightly lower for locating a description of a particular college-football award, where the general category "college football" had to be located first and then the page for the specified

award. But only 52.3 percent could find the almanac page for "a chart showing U.S. exports of oil (petroleum)." In this problem, the almanac entry *exports, imports,* under the general entry *petroleum,* had two page numbers. The first showed imports, the second, exports. Respondents who failed to check the contents of the two pages most likely selected the first, which was incorrect. Just as in the mathematics assessment cited earlier, multistep problems presented difficulties in the literacy survey.

One of the most difficult items in the survey required use of a tax table to find the income tax to be paid by a single person with a taxable income of $15,900. Only 56.4 percent did the item correctly, in part because the amount specified was the end point of one bracket ($15,850-15,900) and the beginning point of another ($15,900-15,950). Only the second bracket was correct, according to the column labels ("At least—But less than"). Once again, where multiple steps or features were involved with distractors present, item difficulty increased dramatically.

As was true of the prose and poetry items, parallels were found with the difficulties revealed by the 1977-78 NAEP mathematics assessment of 9-, 13-, and 17-year olds. In a literacy item involving the transfer of data from an almanac entry to a partially completed graph, only 28.2 percent of the respondents labeled the axes correctly, while 18.5 percent did not respond at all, even though the need for axis labels was indicated. Similarly, in the mathematics assessment, difficulties in dealing with axes (among other failings) were found. Carpenter et al. conclude "In general . . . graph reading skills should not be taken for granted."—a conclusion that also applies to young adults.[47]

Entry Forms

Entry forms, as a group, represented relatively easy literacy tasks when simple information was requested. Over 90 percent correct was scored on 13 of the 25 tasks, and in all of these only a single type of information was required; for example, entering the name of a caller on a telephone message form, entering shipping information on a catalog order form. In each case, clearly identifiable information in a problem statement had to be entered in the appropriate place on a form. For tasks requiring multiple entries plus an additional operation—such as the entry of a check into a checking ledger, with the accompanying date plus computation of a new balance—scores were significantly lower. In four checking ledger tasks, for example, involving two checks, a deposit, and a service fee, scores varied from 65.9 percent to 76.0 percent correct for the same basic processes. The lowest scores occurred for multiple arithmetic operations and for writing a phone message for two items of information.

As was found with other text types, the document form itself was not the major source of difficulty; rather, the processing demands were. For example, 97 percent of the respondents could fill in a phone number on a phone message form, but only 67.8 percent could write an appropriate message on the same form. In both cases, locating the appropriate place on the form for responding required minimal reading. The message task, however, required composition of a message containing two items of information while the

"As was found with other text types, the document form itself was not the major source of difficulty; rather, the processing demands were."

phone number task required reproduction of a single phone number. In no case in this category did the non-response rate rise above 3.7 percent, thus indicating that the respondents, in general, felt that they understood the tasks and knew how to solve them.

This finding contrasts rather sharply with the prose and poetry items, where non-response rates as high as 22.5 percent occurred. It also constrasts with the tabular data items, where non-response rates were as high as 18.5 percent and with the miscellaneous structures group, where these rates reached almost 23 percent on one item. In short, processing demands once again were the main determinants of item difficulty.

Miscellaneous Texts

When requested to locate single items of information in miscellaneous texts—ads, medicine labels, wage and tax statements, room-reservation forms, and the like—respondents scored extremely high. For example, 96.4 percent could locate the time entry on a room reservation form and 94.4 percent could locate the current net pay on a wage and tax statement. However, as processing demands increased, performance declined. Only 88.3 percent could locate year-to-date gross pay on the same wage and tax statement where 94.4 percent correctly found current net pay. For gross pay, one distractor was present while for net pay, no distractors occurred. The addition of arithmetic operations to these processing demands reduced performance even further, with only 44.6 percent being able to make a single division operation to find the cost per ounce of peanut butter and only 25.3 percent explaining correctly how to compute the interest that would be paid on a home loan described in a newspaper advertisement. (See below, under Logical/Mathematical Processing.)

The pattern of performance in this category is similar to that found in other text categories, but perhaps more dramatically displayed because of the items that required arithmetic computations. Basic reading ability was demonstrated on several items where performance was at the 90 percent level or higher. Therefore, problems in fundamental reading abilities alone cannot account for the reduced performance on items with more complex processing demands. The type of processing required is a clear predictor of difficulty; finding a cost per ounce is noticeably more difficult than finding the intersection of two streets (tabular structures), even though both require attention to two items of information.

Similarly, locating four coupons in a newspaper ad from a list of eight shopping items was significantly easier than following four connected directions for walking from one map location to another (tabular structures). Although each problem required four steps or operations, the map procedures were more difficult because each depended upon an orientation (e.g., west, north) and a distance (e.g., two blocks) or terminus (e.g., Beech Street).

Processing Demands

Informational Processing

One result which the Summary Report demonstrates is that almost any

reading task can be made more or less difficult by varying such parameters as the vocabulary relationship between question and text, redundancy of information, or the number of features that had to be satisfied by the correct information. Thus, 90.8 percent of young adults could describe the main idea of a poem that gave many clues to its message but only 37.7 percent could perform the same task for a poem in which no repetition occurred. Where single items of information had to be located in a text, or entered onto a form, and the relationship between the problem statement and the relevant text component was simple, performance tended to be high.

In contrast, where ideas had to be gathered across several sentences or paragraphs, either for selecting an answer from several choices, or for oral or written summary, results were significantly lower. For example, in writing a letter informing a credit department of an error in a monthly credit card bill, only 30.7 percent wrote a completely satisfactory letter, giving all of the relevant information and asking that the error be corrected. Another 27.1 percent wrote satisfactory letters, but without requesting that the error be corrected. Another 24.7 percent stated that an error occurred and gave a single item of identifying information, while the remainder wrote totally unsatisfactory letters (10.1 percent) or did not respond at all. In a related task, only 67.8 percent could write a satisfactory phone message, giving two items of information. Similarly, respondents were weak in comparing descriptions of insurance benefits, in making simple inferences from text statements, and in locating information in complex tables (e.g., tax table). In all of these cases, performance on the simpler items indicated that basic reading was not the central difficulty. Instead, the respondents showed weaknesses in complex information processing.

Text difficulty, as measured by traditional readability, did not appear to be a useful feature for predicting task difficulty. This is not surprising, in that almost all readability measures ignore semantic content. A further problem is that readability is defined only for connected text and requires relatively long passages for obtaining reliable measures. Within a fourth-grade readability story, for example, one might find paragraphs that vary from second- to eighth-grade level. It is not at all clear how a reliable or meaningful readability measure can be computed on a 2-4 sentence excerpt or on the task description that accompanies it; and it is obvious that for the majority of the test items, including almost the entire document scale, traditional readability metrics cannot be applied.

'Text difficulty, as measured by traditional readability, did not appear to be a useful feature for predicting task difficulty. This is not surprising, in that almost all readability measures ignore semantic content.'

Logical/Mathematical Processing

The inclusion of computation items appears, at first glance, to extend the concept of literacy beyond its normal limits. But a comparison of results across items which required identical arithmetic operations shows a central role for processing of printed materials. For example, an item which required the reader to enter two clearly specified amounts on a deposit slip and then find the total deposit, that is, add two decimal numbers, was answered correctly by 93.3 percent of the young-adult population. However, another item which required the reader to find two less clearly specified integers and add them was answered correctly by only 63.7 percent.

This latter item involved a room-reservation form that specified the number of persons expected for an event ("Number Expected: 35") and a comment "Need 6 extra chairs." These two specifications appeared in separate places on the form, which also included a floor plan showing 35 chair symbols ('x') plus the notation '6 extra chairs' against one wall. Subjects had to locate all of the required information, separate it from the irrelevant information (e.g., specifications for tables alone), and decide how to generate the desired total.

It would be misleading to attribute the difficulty of this item to the required arithmetic operation alone. These same subjects, when required to do a similar operation, but one more explicitly stated, performed above the 93 percent level. To extract information from forms like the one in this item, the reader must first locate all of the potentially relevant data, and then make inferences about the meanings and relationships involved. In this case, one must decide whether or not the six extra chairs are accounted for in the 35 who are expected, and whether or not any of the additional furniture which is specified includes chairs (e.g., "small table for projector," "one table for coffee").

We are elaborating on this item because it clearly dispels the notion that the computation items in this assessment were strictly a test of mathematical ability. All 15 of the items on the computation scale involved processing of print in everyday contexts: ordering information from a catalog, selecting a flight from an airline schedule, determining the cost of a simple lunch based on a menu, and so on. As discussed earlier, analyses of the results of NAEP mathematics assessments revealed identical problems for 9-, 13-, and 17-year-olds; namely, that simple arithmetic operations can be performed relatively well when explicitly defined (e.g., "$6 \times 9 = ?$"), but when these same operations are required to solve multi-step word problems, results are significantly lower.[48] In two of the present survey items, problem-solving ability above the simple application of basic arithmetic operations is required. In one of these, the cost per ounce of a grocery product must be determined from the cost and weight (in ounces) given on a label. In the other, the subject must explain orally how to compute the total amount of interest that will be paid over 10 years on a bank loan, using data given in a newspaper ad for home loans.

Only 44.6 percent of the projected population answered the unit-cost item correctly, and only 25.3 percent explained the interest-charge computation correctly. (In the interest problem, only the *method* of computation was required, not the actual amount of interest.) Because these items represent everyday consumer tasks based on real print formats, the results raise serious questions about the workings and outcomes of the American educational system. Amount of schooling clearly makes a difference for performance on these items, with the expected result that the more schooling a subject had, the better he or she performed. On the unit-cost item, for example, fewer than 10 percent of those with less than a high school education could do the item correctly. The increase to only 38.2 percent for high school graduates and to only 61.9 percent for college graduates does not speak well for the quality of the present day high school and college curriculum. *The computational skills involved in both of these items are taught and supposedly mastered in elementary school, and in many states are now included in minimal compe-*

tency examinations. Yet the majority of high school graduates could not do the items correctly. Problem-solving skills appear to have been developed to a lesser extent than the mechanics of calculation.

Between the items which elicited the best and poorest performances, as outlined above, are a range of similar items requiring the extraction of information from non-prose forms, integrated with one or more arithmetic operations. Performance across these middle items ranges from 78.1 percent correct in adding a $50.00 deposit to a check ledger, to 45.3 percent correct for finding single and total prices for four items ordered from a catalog.

Perhaps the most puzzling of these results is the low overall performance (56.4 percent correct) on an item that required computing the change that would be received from $3.00 for two items ordered from a lunch menu. (An associated item, in which the amount of a 10 percent tip on the lunch was to be computed, was answered correctly by only 45.2 percent of the respondents.)

For the lunch-change item, sex and regional differences were insignificant and ethnicity/race differences were relatively small. High school graduates did about 67 percent better than those with 0-8 years of schooling, and college graduates did about 40 percent better than high school graduates. Nevertheless, only 70.1 percent of the high school graduates could correctly locate the prices of two items on a simple menu, add them, and subtract the result from $3.00.

Some further insights into the problems of processing numerical data in print can be gained by considering items that required logical operations on numbers, such as comparison of quantity. In one item, for example, subjects were given bar graphs of energy sources for four different years. For the question, "Which energy source is predicted to supply the MOST power in the years 1980, 1985, and 2,000?", 89.1 percent of the sample population answered correctly. This task could be completed by finding which patterned block was largest in all three bar graphs and then matching the pattern to the appropriate label (petroleum) in the legend. But when multiple comparisons had to be made within a single bar to find which energy source was predicted to supply less power than coal, results dropped to 80.5 percent correct, and for a comparison of each source value across two graphs (i.e., years), results dropped further to 67.7 percent. In each case, "greater than" and "less than" comparisons were required, yet the percentages correct varied according to the complexity of the non-arithmetic processing involved. Finding numeric items in tables when greater or less than comparisons had to be made was also involved in another test item where an almanac table had to be consulted to determine if U.S. oil exports had increased or decreased across two years. Only 62.3 percent answered this item correctly, which is only 12.3 percent above the predicted score for guessing.

Similarly, when subjects attempted to locate on a federal tax table the appropriate tax for a single person with a specified taxable income, only 56.4 percent responded correctly. This item required numeric comparisons to locate the appropriate line. Then, the correct column for the taxable income of a single person had to be identified to find the required tax. However, as discussed above, the specified amount was a boundary point and therefore

'In general, the logical/mathematical item results confirm what has been learned from assessments of mathematical abilities of grade school and high school students: namely, that the basic arithmetic operations can be done successfully when the quantities and operations are made explicit, yet when these same operations apply to data that must be extracted from forms, charts, and the like, or when the operations to be performed are specified in word form or must be inferred from printed specifications, with distractors present, results are dramatically lower.'

appeared on two different lines, although on only one line was it included *within* the specified range.

In each of these cases the general complexity of print processing appeared to be a better predictor of item difficulty than the nature of the arithmetic operations involved. However, tables of numeric data and graphs were difficult for many subjects to use, especially if multiple operations were required for generating an answer. Although the amount of respondent education made a difference in percentage correct, these differences were not as marked as with many other items, indicating that the skills involved are not derived exclusively from formal schooling.

In general, the logical/mathematical item results confirm what has been learned from assessments of mathematical abilities of grade school and high school students: namely, that the basic arithmetic operations can be done successfully when the quantities and operations are made explicit, yet when these same operations apply to data that must be extracted from forms, charts, and the like, or when the operations to be performed are specified in word form or must be inferred from printed specifications, with distractors present, results are dramatically lower. These results hold not only for the items placed on the computation scale by the test designers, but also for items from other scales which involve extraction and comparison of numeric data. The fundamental observation made across these different tasks and assessments is that school students and young adults have adequate abilities for basic tasks, *but are poor problem solvers*. Confronted with tasks where multiple features must be attended to and distractors ignored, performance degenerates rapidly. Skills can be applied in isolation but not in combination.

Summary

What emerges from our review of the assessment data, whether viewed by text type or by processing demands, is that young adults have limited competence in doing complex tasks. Confronted with simple information searches, direct entry of familiar information on a form, or recognition of an oft-repeated theme, they function at a high level. Basic skills in uncomplicated applications show high mastery. But in more complex contexts where judgments of relevance and similarity must be made and several dependent steps or matches done, abilities decline dramatically. Whether this is because basic skills are not learned well enough or whether complex contexts themselves add an unusually high degree of difficulty, we cannot determine from these data. However, our opinion is that the weaknesses derive more from task complexity than from basic skill abilities. There can be no doubt from these data that problem-solving skills are weak, that even college graduates often fail to consider all relevant information in a literacy task, or are confused by logical/mathematical data.

'Our analyses of these findings lead us to conclude that we are not a nation of careful readers nor are we highly competent information processors. In an information age, these deficiencies of young adults should be viewed as particularly troublesome.'

The lowest scoring respondents were probably weak in all levels of skills, but it is surprising that among the most recent, best-educated graduates of America's high schools performance was not better. We can, perhaps, discount low scores on occasional items because of peculiarities in the items themselves, but the mass of evidence remains. These are not, in general, trick items, drawn up to probe the farthest reaches of competence, but ordinary,

everyday tasks, with ordinary, everyday materials. There were no subtle probes of English syntax and semantics, no separations of fact from fiction, and no evaluations of propaganda. *Our analyses of these findings lead us to conclude that we are not a nation of careful readers nor are we highly competent information processors. In an information age, these deficiencies of young adults should be viewed as particularly troublesome.*

5. Comparative Abilities of Selected Subgroups

Inevitably, smaller percentages of young adults are found to perform at increasing levels of proficiency on each of the scales. The fact that fewer and fewer individuals attain these moderate and high levels of proficiency is most pronounced for young adults who terminate their education early and for minority group members.

—Kirsch & Jungeblut, 1986a, p.5.

The preceding discussions of the findings of the NAEP Literacy Assessment have focused on the test performance of the entire sample of young adults. Knowledge of the average performance of the young-adult population is important for understanding literacy proficiencies at a given point in time and for serving as a benchmark for future literacy assessments. At the same time, however, it is equally desirable to assess the degree to which literacy proficiencies varied among key demographic and socioeconomic subgroups of the young adult population. In this section of the monograph, the primary focus will be on a comparative assessment of the mean scaled scores of key subgroups of young adults classified by sex, race/ethnic group, parents' educational backgrounds and formal educational attainment.

Men and Women

Data on the mean scores of men and women on the NAEP reading and the other three literacy scales are presented in Table 1. As noted earlier, the mean score for each of the three literacy scales was set at 305, with a standard deviation of 50.[49] *The mean scores of men and women on each of these literacy scales were essentially identical.* The absolute sizes of the differences between the mean scores of men and women are never larger than 1.1 points, and none of them are large enough to be considered statistically significant at conventional levels, e.g., the .05 level. This finding of equality in literacy outcomes among men and women is in close accord with that of other recent national efforts to test the reading abilities of teenagers and young adults, including the 1980 national Armed Services Vocational Aptitude Battery testing and the 1980 High School and Beyond Study.[50] The one major exception to this pattern is that of the National Assessment of Educational Progress.[51] The NAEP assessments of the reading and writing skills of 17-year-old men and women in the high schools of the U.S. indicate that women have significantly out-performed men on these tests during the past 15 years. This finding suggests that the NAEP tests, which are geared to school-based reading curriculum, may not adequately measure abilities of high school students to apply reading skills to the diverse array of literacy tasks encountered in daily life situations.

Table 1

Mean Scores of Respondents on the Four Literacy Scales Total and by Sex			
Scale	Total	Female	Male
NAEP Reading	305.0	305.4	304.6
Prose	305.0	304.5	305.6
Document	305.0	304.8	305.3
Quantitative	305.0	305.1	304.9

Race/Ethnicity

Findings of the NAEP Young Adult Literacy Assessment for each of the four major race/ethnic groups are presented in Tables 2 and 3, the former utilizing scale scores, the latter utilizing percentiles. The race/ethnic patterns of differences in mean scores are identical for the NAEP reading and each of the three literacy test scales. White young adults achieve the highest mean scores on each of the reading and literacy scales, followed by other non-White Americans (Asians, and Native Americans), Hispanic Americans and then Black Americans. The absolute size of the gaps between the mean scores of White and Black Americans exceeds 50 points, or one full standard deviation. The mean scores of Hispanic young adults typically tend to fall halfway between those of White and Black young adults and range between .5 and .7 standard deviations below those of White young adults.

Table 2

Mean Scores of Respondents on the Four Literacy Scales by Race/Ethnic Group				
Scale	White	Black	Hispanic	Other
NAEP Reading	313.8	263.3	286.6	299.0
Prose	314.4	258.3	285.5	304.5
Document	315.7	255.7	278.7	298.2
Quantitative	314.6	259.1	280.3	306.4

Table 3

Percentile Rankings of Mean Scores of Respondents on the Four Literacy Scales, by Race/Ethnic Group				
Scale	White	Black	Hispanic	Other
NAEP Reading	60	24	37	48
Prose	61	20	37	52
Document	61	21	34	46
Quantitative	61	23	34	52

A portion of the differences between the mean scores of White Americans and those of Black and Hispanic Americans is attributable to differences in their formal educational attainment. Both Black and Hispanic Americans

were nearly twice as likely as White Americans to have terminated their schooling without receiving a high school diploma, and White Americans (40 percent) were nearly twice as likely as Black (21 percent) and Hispanic Americans (21 percent) to have completed two or more years of college. While the score advantages of White young adults are due, in part, to their greater schooling attainment, large differences remain between White and Black young adults even when controlling for years of schooling completed as Table 4 shows for one of the literacy scales.[52] In general, Hispanic scores lag about 0.5 standard deviation units behind White scores for equal educational attainment while Black scores typically lag about 1.0 standard deviations behind White scores. Thus, the overall score differences between race/ethnic groups tend to be reduced by only a small amount when educational attainment is considered. The remarkable size of the difference is reflected in a comparison of the mean scores of Black four-year college graduates with White high school graduates (Table 4). The latter group performs nearly as well even though they have had four years less schooling. Tabulations by parents' education show roughly the same differences, with children of White high school graduates outscoring children of Hispanic and Black high school graduates by about 0.6 and 1.0 standard deviations, respectively. When all of the variables monitored by the survey are controlled—background, demographics, education, and literacy practices—only about one-third of the race/ethnicity differences disappear; the remaining differences are still quite large.

Table 4

Mean Prose Scores of Young Adults by Race/ Ethnicity and Years of Formal Schooling Completed

Years of Schooling Completed	White	Black	Hispanic
8 or Less	250.6	196.9	213.3
Some High School	274.9	230.3	247.4
High School Graduate, No College	300.6	253.0	285.8
College Degree, Two Years	332.3	289.6	—
College Degree, Four Years	345.4	308.7	340.9

While a majority of the young adults with the most severe literacy deficiencies are White, above average shares of those with large deficits are represented by Black and Hispanic Americans. The higher frequency of serious literacy deficiencies among Black and Hispanic young adults has important implications for the nation's schools, the economy, and social justice goals of the nation. The declining size of the nation's young adult population during the next decade will be accompanied by a rising proportion of Black and Hispanic people. The number of people 18-24 years old in the U.S. population peaked at the end of the 1970s and is projected to continue to fall continuously throughout the next decade, i.e., 1986-1996.[53] During 1985, Black and Hispanic people accounted for 20 percent of the civilian noninstitutional population of 21-25 year olds. During the same year, Black and Hispanic youngsters accounted for 23.3 percent of all people 16-19 years old and 24.3 percent of all 10-15 year olds in the nation's civilian noninstitutional population. In the absence of substantial improvements in the literacy skills

of minority youth in the 10-19 age group, the literacy proficiencies of people 20-25 years old over the next decade will likely decline. Combined with the shrinking pool of young adults available for jobs in the civilian sector and in the nation's armed forces, the costs to the economy, to the national defense, and to the attainment of economic and social justice goals for our nation's race/ethnic groups could be high.

Family Background

> *Home support variables (such as parents' education and access to literacy materials) were found to be significantly related to the type and amount of education and to the literacy practices reported by young adults. These, in turn, help to explain differences in literacy skill levels.*
>
> —Kirsch & Jungeblut, 1986a, p.5.

The literacy skills of America's young adults are acquired not only in the formal school system, but also in the home environment, on the job, and in informal social settings.[54] One would expect the test scores of young adults in our sample to be associated with the educational backgrounds of their parents. Assessment data reveal that the mean scores of young adults on the NAEP reading and each of the literacy scales were uniformly associated with the educational attainment of the parents.[55] Those young adults whose parents had graduated from high school (but no college) achieved mean scores that were typically 30 to 35 points, or .6 to .7 standard deviations, above those obtained by young adults whose parents did not graduate from high school. Those young adults whose parents completed two or more years of college obtained the highest mean test scores on each of the literacy scales. Their mean scores were consistently more than one standard deviation above those of young adults whose parents had completed less than 12 years of schooling. Two full standard deviations separated the scores of the children whose parents had the most versus the least education. These patterns tended to prevail for youth in each of the four race/ethnic groups.

The finding of a substantial influence of parental educational background on the literacy test scores of respondents has important implications for intergenerational mobility in American society. Parents' formal educational attainment influences these literacy outcomes in a variety of direct and indirect manners. Multivariate statistical analyses of the assessment data revealed that parents' educational attainment has a substantial influence on the availability of literacy materials in the home, the choice of a college-preparatory curriculum during high school, and the ultimate amount of educational attainment achieved by young adults.[56] Given the finding that the literacy scores of young adults are critically influenced by the educational attainment (and literacy proficiencies) of their parents, one has to express concern about the growing numbers of children living in poverty families, especially those living in single-parent families where the parent literacy level is low. During March, 1985 more than 22 percent of all youth under age 18 and 27 percent of those under age six were living in poverty families, many of

them in single-parent families. Many of the young adults who had children present in the home at the time of the assessment, especially those from Black and Hispanic backgrounds, had quite limited literacy skills. In the absence of comprehensive efforts to bolster the literacy proficiencies of these young parents, their children will be at a serious disadvantage in the schools and in the future labor markets of the nation. Intergenerational mobility for these poor young children may thus be severely restricted in the absence of substantive efforts to boost their literacy proficiencies both in the school and in the home.

Educational Attainment

> *On average, young adults perform significantly better on the NAEP reading scale than do in-school 17-year olds. This suggests that further education and participation in society contribute to the improvement of reading skills represented by that scale.*
>
> —Kirsch & Jungeblut, 1986a, p.5.

Relationships between literacy proficiencies and formal educational attainment are not unidirectional, but rather are mutually reinforcing. On the one hand, young adults who spend more time in formal schooling activities do improve their literacy skills at higher rates than those who complete fewer years of school.[57] On the other hand, those young adults who possess stronger literacy skills will be more likely to complete high school, enroll in post-secondary education institutions, and obtain either two-year associate degrees or four-year B.A. and B.S. degrees.[58] To the extent that the above relationships hold true for youth in American society, we should observe strong positive associations between the mean test scores of young adults and the number of years of formal schooling that they have completed up to the date of the assessment interview.

The data reveal strong positive associations between literacy proficiencies and schooling attainment. These relationships hold consistently for the NAEP reading and each of the three other literacy scales. For example, the mean score on the prose literacy scale was 263 for young adults who dropped out of high school, 292 for high school graduates, 327 for those obtaining a two-year Associate's Degree, and 343 for those obtaining a B.A. or B.S. degree. High school graduates not going on to college typically achieved mean scores on each of the literacy scales that were 30 points, or .6 standard deviations, above those of high school dropouts. Four-year college graduates out-performed high school graduates on each of the literacy scales by 50 or more points, or by a full standard deviation. The gaps in score performance between college graduates and high school dropouts are extraordinarily large on each of the literacy scales. The absolute size of these differences in mean test scores between college graduates and high school dropouts ranged from 80 to 90 points on each scale.

The strong associations between literacy skills and formal educational attainment hold for each race/ethnicity subgroup as well as for the entire sample of young adults. Some insight into this relationship can be gained

from Table 5 which shows percentile rankings by educational attainment for Black and Hispanic adults. The typical Black high school dropout received a percentile ranking of 10, indicating that half of the Black high school dropouts have literacy skills in the bottom 10 percent of the test distribution for young adults in American society. This finding is nearly identical to that from the 1980 national ASVAB testing.[59] The mean scores of Black high school graduates were equivalent to percentile rankings at or near the 20th percentile while Black graduates of four-year colleges and universities typically fall between the 50th to 60th percentile range. While the percentile rankings achieved by Hispanic adults were above those of young Black adults on each of the scales, the patterns of results were similar to those of Black and of White adults. Hispanic adults who completed more years of formal schooling achieved higher mean scores on each of the literacy scales. As noted above, the nature of the relationship between these two variables is not one of simple cause and effect. The two variables interact with each other, with higher literacy skills generally leading to both the desire and the ability to complete additional years of formal schooling.

Table 5

Percentile Rankings of Mean Scores of Black and Hispanic Respondents on the Four Literacy Scales, by Years of Formal Schooling Completed

	Black			Hispanic		
Scale	High School Dropouts	High School Graduates	4-Year College Graduates	High School Dropouts	High School Graduates	4-Year College Graduates
Reading	10	23	61	20	36	68
Prose	12	18	56	16	37	80
Document	10	20	50	15	33	68
Quantitative	9	20	51	16	30	58

The poor performances of many Black and Hispanic high school graduates who did not go on to college should be viewed as a major national concern by educators and economic policymakers. During the past eight years, the proportion of Black high school graduates (18-24) enrolled in college has been declining in both absolute terms and relative to White high school graduates. In 1976, approximately one-third of all Black high school graduates 18-24 years old were enrolled in college.[60] This ratio was essentially identical to that of White high school graduates in the same age group during that year. The Black college enrollment ratio has declined fairly continuously since that time. By October 1984, only 27 percent of Black high school graduates (18-24) were enrolled in college versus 34 percent of White high school graduates.[61] The decline in Black college enrollment during this period undoubtedly has been influenced by economic factors (rising cost of education) and declining real incomes of adult Black males. However, the limited academic achievement of many Black high school graduates is also exerting an adverse influence on college enrollment decisions and will contribute to a widening of the gap in Black/White economic status unless it is rectified.[62]

"The poor performances of many Black and Hispanic high school graduates who did not go on to college should be viewed as a major national concern by educators and economic policymakers. During the past eight years, the proportion of Black high school graduates (18-24) enrolled in college has been declining in both absolute terms and relative to White high school graduates."

High School Dropouts

Approximately 15 percent of the young adults in the English-speaking sample did *not* obtain a high school diploma, with the vast majority terminating their schooling at some point during their high school years. The most frequent reason cited by young adults for leaving school prior to high school graduation was "boredom." "Work" and pregnancy were also cited by more than 10 percent of the respondents, with males nearly three times more likely than females to cite "work-related" reasons and one-fifth of females noting that pregnancy was the motivating force behind their decision to leave school. While the reasons cited by respondents are based on retrospective recall of decisions that could have been made as far back as 10 years, the pattern of findings is consistent with that of other recent national surveys, including the 1982 High School and Beyond survey.[63] The typical 1980 high school sophomore who dropped out of school prior to graduation had a grade point average in the C range. Most young adults leaving high school did not flunk out, but rather saw little personal value in remaining in high school through graduation. Whatever their ultimate reasons for leaving high school, young adults failing to obtain a high school diploma suffer from serious literacy deficiencies, typically scoring 40 to 60 points below the mean for all young adults.

Those young women leaving school because of pregnancy were consistently at the very bottom of each literacy-skills distribution.[64] Their extremely severe literacy deficiencies will make it difficult for them to participate actively in the labor force, obtain earnings high enough to enable them and their families to avoid income inadequacy and dependency, and to provide a home learning environment for their children that will enable them to acquire basic learning skills competitive with those of other children in society. The likelihood of intergenerational transfer of literacy problems increases in proportion to the literacy deficiencies of the parents of young children in society.

Alternative High School Certification

Among young adults who left school without a diploma, those who indicated that they had studied for a General Education Diploma (GED) at some point after leaving school were characterized by mean scores 10 to 20 points above those who did not study for a GED or high school equivalency degree. Young adult dropouts with stronger literacy skills were, thus, more likely to seek a GED after leaving high school. However, only 40 percent of those studying for the GED indicated that they had received a GED by the time of the NAEP literacy assessment.[65] Black young adults were far less successful than either White or Hispanic young adults in obtaining a GED. Those acquiring the GED had literacy scores well above both those who never studied for a GED and those who studied for, but did not receive the GED. We cannot state with any certainty whether these differences in scores are due to the learning gains achieved by GED holders during the period of their participation in the program or to pre-existing literacy differences. The basic fact remains, however, that the GED appears to be a proxy for higher literacy proficiencies.

Employment and Earnings

During the past few years, increased national attention has been paid to the role of formal education and literacy in promoting social and personal economic goals.[66] The NAEP background questionnaire collected information from repondents on their employment and earnings experiences during the twelve-month period immediately preceding the assessment. NAEP data on the employment and earning experiences of young adults were examined together with data on their literacy scores and formal educational attainment to identify the degree of association between literacy proficiencies and employment outcomes.

Our analysis of the NAEP data revealed that both women and men with more proficient literacy skills achieved superior employment records, avoided prolonged unemployment more frequently, and earned higher hourly wages than their counterparts with weaker literacy skills. For example, only 53 percent of those women with prose scores in the bottom quartile of the distribution were employed at some point during the previous twelve-month period. The percentage of women with jobs during that period rose to 75 percent for those in the second quartile and to 82 percent for those in the top quartile. Similar relationships apply for the document-utilization scale. The percentage of women working during the previous 12-month period ranged from 53 percent for those in the bottom quartile to 84 percent for those in the top quartile.

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The relationships between scores on the prose literacy scale and the percentage of women employed year round are also quite strong. Only 29 percent of those women with scores in the bottom quartile of the prose distribution worked year round. This ratio rises to 49 percent for women in the second quartile and to 56 percent for women in the upper quartile. Year-round employment rates are twice as high for women in the top half of the distribution relative to those in the bottom quartile. Over half of all women with 12 or fewer years of schooling who claimed they had looked for work, but could

Table 6

Employment Experiences and Hourly Wages of Women With 12 or Fewer Years of Schooling, by Position in the Prose Distribution

Quartile of Test Distribution	Percent Employed Last Year	Percent Employed Full-time Year Round	Percent Who Looked But Could Not Find Work	Percent With Hourly Wages Above $6.00
Bottom quartile	53.0	29.0	7.9	11.0
Second quartile	75.2	48.5	3.1	16.0
Third quartile	73.2	55.0	3.4	34.1
Top quartile	82.1	56.1	0.4	39.1

not find it, fell in the bottom quartile of the prose test score distribution (see Table 6). Less than one-half of one percent of those women with prose scores in the upper quartile of the distribution reported that they had looked for work during the previous twelve-month period, but had been unable to find it.

In addition to their favorable effects on the employment experiences of young adults, literacy proficiencies also appear to affect positively hourly wages earned. Only 11 percent of women in the bottom quartile of the prose score distribution earned hourly wages in excess of $6.00. This percentage figure rises to 16 percent for those in the second quartile, to 34 percent for those in the third quartile, and to 39 percent for those in the top quartile.

Nearly 95 percent of all males with 12 or fewer years of schooling were employed at some point in the past 12 months (see Table 7). The only group under 90 percent were males in the bottom quartile of the prose and document literacy distributions. Those males with stronger prose and document-utilization skills worked full time, year round and achieved hourly wages over $6.00 at consistently higher rates than those with more deficient literacy skills. For example, males with prose scores in the upper half of the distribution were 28 percent more likely to be employed year round than were males in the bottom quartile, and they were 30 percent more likely to earn wages over $6.00 per hour. Nearly 60 percent of males who looked for work but could not find any job during the preceding twelve-month period had prose literacy scores in the bottom quartile of the distribution. Literacy proficiencies of young males with 12 or fewer years of schooling clearly played a substantive role in influencing their success in the labor markets of our nation at mid-decade. In relative terms, literacy proficiencies play an even greater role in determining the labor-market success of young women; however, this finding is likely related to the fact that employed young women report using reading and computation skills twice as many hours per working day as do men.[67] Over 92 percent of all females and 98 percent of all males with 13 or more years of schooling were employed during the preceding 12 months. Less than 1 percent of both groups looked for work, but were unable to find it. Joblessness among young American adults in the mid-1980s is clearly a problem highly concentrated among those with the poorest literacy proficiencies.

Literacy proficiencies of young adults with one or more years of post-secondary schooling are associated with the hourly wages they were earning. These findings hold true for both men and women. For example, only 28 percent of the women with prose scores in the bottom quartile were able to earn hourly wages of $6.00 or above. This ratio rises consistently with relative position in the prose-skills distribution, increasing to 40 percent for those in the second quartile and to 50 percent for those women in the top quartile. The relationships are almost identical for the document utilization scale.

Table 7

Employment Experiences and Hourly Wages of Males With 12 or Fewer Years of Schooling, by Position in the Prose Distribution

Position in Test Core Distribution	Percent Employed Last Year	Percent Employed Full-time Year Round	Percent Who Looked But Could Not Find Work	Percent With Hourly Wages Above $6.00
Bottom quartile	88.6	55.5	10.5	39.1
Second quartile	97.9	67.4	2.0	46.6
Third quartile	94.6	70.3	4.3	45.0
Top quartile	97.8	71.6	1.6	55.8

The Poor and Near Poor

During the 1980s, the percentage of persons and families in the U.S. with incomes below the poverty line has remained well above those prevailing during the early 1970s. The rise in the number of American families with incomes below the poverty line and the increasing difficulty in reducing poverty problems solely through economic growth has led to a re-examination of the nature and causes of poverty. The NAEP data dramatically reveal strong associations between income inadequacy problems of young adults and both their formal educational attainment and their relative position in the literacy distribution. For example, nearly 50 percent of young adults with 12 or fewer years of schooling who had NAEP reading scores in the bottom quartile of the distibution were members of poor or near poor households. This percentage falls consistently as we move up the literacy distribution. Under 15 percent of those with 12 or fewer years of schooling in the top quartile of the reading distribution were living in poor or near poor households. In addition, only 6 percent of those young adults with 13 or more years of schooling who had reading skills in the upper half of the test distribution were poor or near poor. This incidence of income inadequacy is only *one-eighth* as high as that for those young adults in the bottom quartile of the literacy distribution and also 12 or fewer years of schooling. Similar findings apply for each of the other literacy scales, and they apply equally as well to men and women. Increased educational attainment and strong literacy proficiencies do not eliminate the possibility of poverty, but they sharply diminish the likelihood of young adults experiencing income inadequacy problems in American society.

"Increased educational attainment and strong literacy proficiencies do not eliminate the possibility of poverty, but they sharply diminish the likelihood of young adults experiencing income inadequacy problems in American society."

Political and Civic Behavior

Voting Behavior

Among the basic rights of young adults is the right to vote, but participation in the political process through voting is far from universal. Overall, slightly

more than two-thirds of the respondents indicated that they were currently registered to vote. The percentage of young adults who were registered to vote varied positively and consistently with formal educational attainment. Only 38 percent of the young adults with just a primary school education and only 45 percent of the high school dropouts were registered to vote. The percentage of respondents who were registered to vote rose to nearly 65 percent for high school graduates and to 82 percent for those with a two- or four-year college degree. Those young adults with two or more years of postsecondary schooling were thus nearly twice as likely as high school dropouts to have registered to vote at the time of the NAEP assessment. Those young adults who had registered to vote were characterized by mean scores on each of the NAEP reading and literacy scales that were 18 to 23 points above those of young adults who had not registered to vote.

About 92 percent of the young adults who registered to vote had exercised that right by voting in an election held inside the U.S. The incidence of voting varied sharply by years of formal educational attainment, ranging from lows of 25 percent for those with a primary school education to a maximum of 80 percent for those young adults with two or more years of postsecondary schooling. The mean literacy scores of those young adults who had exercised the right to vote were typically 25 to 29 points, or .5 to .6 standard deviations, above those of non-voters. The more literate and educated young adults in American Society clearly take greater advantage of their right to vote. The least literate members of American society disenfranchise themselves, an outcome that should not be ignored by Americans concerned with broad-based political participation by the citizenry.

Awareness of Public Events

The frequency with which the young adults kept themselves informed of public events was positively associated with their years of formal educational attainment. For example, slightly more than 57 percent of high school dropouts reported that they kept themselves informed of public events either most of the time or some of the time. This percentage rises to 70 percent for high school graduates and to 84 percent for those with a college degree (i.e., two or more years of post secondary schooling).

An examination of the data on the mean scores of those in each response category reveals that those respondents with more proficient literacy skills were more likely to keep themselves frequently informed of public events. Mean scores of young adults on each of the scales rise consistently with the frequency of efforts to educate themselves on public events. Those who identified themselves as making such efforts "most of the time" had mean scores on each scale approximately 25 points, or .5 standard deviations, above those making such efforts only "now and then" and 30 to 35 points, or .7 standard deviations, above those "rarely" making efforts to inform themselves of public events. Clearly, the less literate make fewer efforts to keep themselves informed of public affairs. To what extent this is due to their inability to process print information on public events or to comprehend and interpret visual communications on public and governmental affairs, we cannot say.

Participation in Community Activities and Organizations

Approximately one-third of the assessment population indicated that they participated in community activities at least once per month; another one-third stated that they participated only one or two times per year, and the remaining one-third noted that they never participated in community affairs. The frequency with which young adults partcipated in community activities varied positively with years of formal schooling and mean scores on the literacy scales. Only 20 percent of the high school dropouts reported participating in community activities at least once per month. In comparison nearly 30 percent of high school graduates did so as did 45 percent of college graduates. Those respondents who participated in community activities on a weekly or monthly basis were characterized by mean literacy scores that were consistently 25 points, or .5 standard deviations above those of respondents who indicated that they never participated in community activities.

Approximately 58 percent of the young adults mentioned membership in at least one civic, religious, community, social or professional organization, with religious (27 percent), sports (25 percent), and professional organization (16 percent) memberships being cited most often. Less than 5 percent of the respondents identified membership in a political organization, and under 10 percent cited membership in a community service organization. Not surprisingly, the mean literacy scores of respondents belonging to professional organizations were the highest; however, those young adults belonging to political organizations and community service organizations also obtained mean scores on each of the literacy scales well above the average. Members of religious and sports organizations also obtained above-average test scores. Persons not belonging to any organization had below-average literacy proficiencies.

Marginal improvements in the literacy proficiencies of American youth will not, by themselves, radically alter the political, civic, and social behavior of the next cohort of young adults; however, we do believe that efforts to strengthen literacy proficiencies and instruct youth in their duties and responsibilities as citizens will contribute to a more enlightened and politically active citizenry. Such objectives are in close accord with those noted nearly 170 years ago by Thomas Jefferson in his commission's report to the Virginia legislature on the choice of a location for the University of Virginia. In that report, Jefferson noted that among the objectives of a primary education was that of having a young person "understand his duties to his neighbors and country, and to discharge with confidence the functions confided to him by either."[68] Improved literacy proficiencies and educational attainment among the nation's young adults can play a role in increasing the frequency with which such duties are discharged.

6. Reflections

Education

> *As a society, we will have to develop and apply appropriate intervention strategies to meet the diverse needs of these young adults. Strategies must be tailored not only to help those whose literacy skills are most limited, but also to upgrade the literacy skills of those who demonstrate low to moderate levels of proficiencies. In addition, we must find ways to expand the number of those in our population who are able to perform society's more challenging tasks.*
>
> —Kirsch & Jungeblut, 1986a, p.6.

The NAEP Assessment does not suggest that our literacy problems can be solved by addressing a few alterable school practices. A small group of these young adults never reached high school, for reasons that were not revealed. A larger group dropped out of high school before graduation because (they reported) of boredom, pregnancy, the need to go to work, marriage, or other personal reasons. The vast majority of these were highly deficient in literacy skills. Even many of those who graduated from high school failed to acquire what we estimate to be the basic literacy skills needed for employment, citizenship, and effective parenting, while others acquired a marginal level that left them unable to cope with the literacy demands of the more remunerative occupations. Even a college education does not guarantee the ability to cope with everyday literacy tasks. For example, 38.4 percent of the estimated population of young adult college graduates did *not* correctly state even one difference between two briefly described insurance plans, and approximately 38 percent did not correctly estimate the cost per ounce for a grocery item, where the price tag gave the weight (20 oz.) and the total price ($1.99).

'Given these results, plus further observations from the study that young adults who engaged in extensive reading activities scored higher, independent of educational attainment, than those who didn't, we suggest that responsibility outside of the home for improving young adult literacy skills be vested primarily in three agencies: public schooling, job training, and the media (i.e., television, radio, newspapers, and magazines). We make these recommendations because we see little hope that in the near future all students will receive an adequate education in elementary and secondary school.'

Given these results, plus further observations from the study that young adults who engaged in extensive reading activities scored higher, independent of educational attainment, than those who didn't, we suggest that responsibility outside of the home for improving young adult literacy skills be vested primarily in three agencies: public schooling, job training, and the media (i.e., television, radio, newspapers, and magazines). We make these recommendations because we see little hope that in the near future all students will receive an adequate education in elementary and secondary school. The problems that lead to irregular school attendance, poor academic performance, and premature termination of schooling will not disappear quickly, even with a renewed national effort to improve the lot of the poor and the disadvantaged, whose numbers have been growing. A high divorce rate, a growing number of children living in poor, one-parent families, a serious drug problem that permeates all levels of society, and continuing divisions within society between races and ethnic groups all affect schooling and school-based achievement. To improve literacy skills in the present environment, all agencies in society that have continuing contact with youth and young adults must be mobilized. In the following two sections we discuss

in more detail what these various agencies might do to improve literacy skills in America.

Schooling

> *To the extent that the skills identified in this literacy study are important for full participation in our society, this assessment raises questions about whether we should seek better ways to teach the current curriculum or whether we need to reconsider what is taught as well as how we teach it.*
>
> —Kirsch & Jungeblut, 1986a, p.6.

Given our view of the limitations of the schools' traditional approach to literacy, we urge two things. We urge schools to continue the difficult task of preserving traditional Western culture and political ideas, while finding ways to attract and relate to students whose parents have not grown up in that culture. And we urge schools to reconsider the literary emphasis in the K-12 reading curriculum. In addition to the skills for understanding and enjoying fiction and poetry, they should emphasize those skills and strategies that underlie the processing of expository prose and non-continuous documents like bureaucratic forms.

In one sense, public schools should be staunchly conservative. They should conserve the arts of reading and writing. Since literacy is the most important product of the schools, training in literacy skills—from basics to advanced skills, for all groups—should receive a much higher priority, and be more generally shared by all teachers than it now is. To insist upon excellence in reading and writing standard English is a vital, conservative function of schools. Schools must be the guardians and promoters of a common print literacy. In another sense, though, the schools should be flexible and innovative. They will not achieve the goal of solid literacy skills for all children if they just stand on tradition. They must find ways to deal successfully with the mismatch between adult reading roles and the reading curriculum in the schools.

Our emphasis on literacy skills for the K-12 curriculum is in contrast with those who have recently reasserted the importance of a cultural tradition in the teaching of literacy skills. Some believe that the schools lost their commitment to the traditional Western literacy core in the 1960s, in favor of content-free, value-neutral skills training.[69] We are not sure to what extent this, in fact, occurred. In any case, our view is that the literacy skills students sorely lack—skills of logic, inference, and synthesis—have never been stressed in schools and yet are imperative for autonomous, effective adult life. Nor is such training incompatible with insistence on a shared cultural literacy, a common core of reading experience in excellent texts. We would emphasize, however, that the content should be revised continually to incorporate excellent, important texts that have been ignored previously. We do not need a resurgence of tradition. We need to commit ourselves to a delicate balance of tradition, revision, and discovery.

The fundamental weakness in literacy ability revealed by the present study is in complex information processing. If Americans had no greater literacy

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challenges than writing their names on social security cards, locating single facts in newspaper articles or streets on a map, then no major changes would be warranted in educational programs. But distressing weaknesses were found in everyday tasks that required attention to multiple text features, or the integration of information over many sentences. A casual inspection of the most popular basal reading programs used by elementary schools and of the standardized achievement tests most often used for district and state testing shows that these are skills that are rarely taught except in relation to narrative texts, and rarely tested with forms, charts, and other non-prose texts.

Many of the survey items which involved logical comparison or computation in this survey do not fit neatly into the traditional reading or math curriculum of the elementary and secondary schools. Reading is taught primarily from fictional selections, with perhaps 20-25 percent inclusion of expository materials in the more recent basal series.[70] Within these same texts, almost no serious attention is given to non-continuous print forms such as labels, charts, and tax forms. When these do occur in reading programs they generally are afforded a lower status than the fictional selections. Even then, they are usually presented in abbreviated lesson form, without the attendant instructional apparatus and suggestions for extensions and supplements that characterize lessons on other types of selections. In mathematics programs, strong efforts are now made to teach verbal problems, but insufficient attention is given in these texts to "reading" issues.

Some applied literacy skills are presented in reading series and more expository passages are now included than were found ten years ago, but the *primary emphasis of elementary reading programs, particularly in the middle and secondary levels, continues to be on the comprehension and enjoyment of fine literature.* Direct instruction on those skills and strategies that would lead to finding an entry in a tax table, or to summarizing information in an article on economics rarely occurs. The results of this long-standing emphasis on fiction are inadequate for present-day literacy demands, even when tested with prose materials.

Part of the problem we perceive is that the complexity of the skills needed for reading a tax table or computing a unit price from a grocery label is not appreciated by designers of reading programs and is of limited interest to their counterparts in other curricular areas. Social studies and science texts, for example, have only recently demonstrated an interest in including literacy training in their lesson plans, but have yet to develop direct, sustained instruction around such skills. At issue is both the understanding and attitude of curriculum designers toward the skills involved and the compartmentalization of knowledge within the curriculum that leaves such skills as those underlying the reading of a table of energy exports in a nether world where no regular curriculum penetrates. Print-processing skills which involve logical and mathematical operations, including comparison of numeric quantities, must become a regular part of the elementary and secondary curriculum.[71]

A far deeper schooling issue relates to the basal reader approach to teaching comprehension skills. The current partitioning of reading skills into *inferential* and *literal* classes, with the further subdivision of the former into *cause-and-effect, time sequence, enablement,* and the like, while logically

appealing, may be part of the cause for poor performances on higher level reading skills as measured by the NAEP reading assessments of in-school students. The complexity of real reading tasks depends less on the differences among these classifications than it does upon the number of text features that must be processed, the presence of irrelevant or other distracting information, vocabulary difficulty, and the match between task statement and text wording. Yet basal readers show little awareness of the importance of these latter factors.

Results of the present assessment suggest a kinship between literacy skills and mathematical problem-solving skills. Similar elements appear to contribute to the difficulties in each—number of steps to perform, number of features to attend to, presence of distractors or irrelevant information, etc. *These are not features that are monitored in the selection of passages for basal readers nor do they figure prominently in present-day comprehension instruction.* The over-dependence of reading series and reading instruction on content-free readability measures further obscures many important text properties from the attention they require. Like aspirin and Band-aids, readability measures can assist in building healthy instruction; they should not, however, be confused with actual assessment of text content and task difficulty.[72] We cannot claim with great confidence that the features identified in this survey are the most valid predictors of literacy task difficulty that can be found. Nevertheless, their relationship to task difficulty is sufficiently robust to warrant a rethinking of comprehension instruction. *Perhaps, also, the time has come to consider literacy instruction that extends beyond traditional reading comprehension.* Current research on instruction suggests that skills such as those surveyed here need to and can be taught directly.[73] The integration of reading, listening, writing, and speaking may not derive easily from separate experiences with these processes, and the more complex literacy abilities that combine, for example, reading, logical/mathematical analysis, and composition might not develop to their desired levels from separate instruction in the included subjects.

Higher-level reading skills of 9-, 13-, and 17-year-olds have shown no real improvement between 1971 and 1984, according to the NAEP Reading Assessments.[74] Young adults, according to this assessment, were also uniformly weak in performing more complex everyday literacy tasks. Perhaps this is sufficient evidence to call for an extensive review of the school-based language arts curriculum and for the research agenda that supports it. There is already a constituency for teaching higher-order prose skills, generally among parents of academically talented children, but there are two potential problems attending their demands. One is that educators, comforted by recent improvements in reading achievement test scores, will ignore the demand for further improvements. The other is that educators will try harder to give attention to such skills, but only for the best students. Although it is inevitable that there will always be a range of skills among the general population, the schools should be fighting stratification, not reinforcing it. Thus we must not assume that critical reading/thinking skills are reserved for older children or children in advanced classes. The NAEP literacy assessment, with its sharp drop-off among all groups at the more advanced levels, and its wide gaps among groups at the middle levels, should serve as a timely

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warning against the dangers of complacency and excessive stratification in the teaching of advanced literacy skills.

Lastly, we find as a particular failing of current reading assessments their acceptance of the school curriculum as the basis for assessment, and not the everyday literacy tasks that the curriculum supposedly prepares students to achieve. For the NAEP reading assessment of elementary and secondary students, in particular, we feel that the literacy demands of citizenship, consumer activities, work, and recreation are proper objects of concern, particularly at 13 and 17 years of age and not just the highly selective and circumscribed tasks of the classroom. These tasks, as we have stated already, can be as demanding of higher level thinking skills as those based on other types of texts. There are sufficient data from the results of standardized achievement testing to ascertain how well the schools are attending to their own curriculum. What is more urgently needed is an assessment of how well the products of our existing educational system can apply the skills they acquire for social and individual ends.

Non-School Agencies

> *It is clear that there is no single step or simple action, which if taken, will allow all individuals to become fully literate. Becoming literate in our society is a lifelong pursuit affected by such factors as home environment, economic situation, aspirations, opportunities, and education. As a result, we must recognize the intergenerational effects on literacy.*
>
> —Kirsch & Jungeblut, 1986a, p.7.

One of the hallmarks of scholarship on education since 1960 has been its emphasis on the nature and influences of education outside of schools. Bernard Bailyn persuaded educational historians to look at the transmission of knowledge and culture in church, family, and workplace.[75] The sociological work of James Coleman and Christopher Jencks underscored the pervasive influence of family background characteristics and behavior in educational achievement;[76] Shirley Heath has delineated the different worlds of literacy in communities outside the school doors;[77] and Lawrence Cremin has urged us to consider the curricula of libraries, museums, day care centers, and television programs when thinking about educational policy.[78] Furthermore, it is one of the distinctive features of the NAEP young adult literacy assessment that it investigated everyday adult reading tasks not through school-type, multiple-choice exercises but by putting the respondents in situations that required them to respond orally or in writing to questions about newspapers or forms or schedules. Given all this attention to literacy tasks and learning environments outside of schools, it is clear that no policy for upgrading the nation's literacy skills can succeed if it focuses solely on the schools.

"With all this publicity about reading problems, and with the prospect of substantial fund-raising, what more is needed? We believe that the current campaign has too many features of previous efforts to "wipe out illiteracy," chiefly, an insufficient understanding of the nature and degree of literacy problems, insufficient federal and state dollars and insufficient breadth of concept."

Of course, we are not the first to observe the need for coordinated effort between different educational agencies. Recent literacy campaigns have emphasized such integrated approaches. The Center for the Book at the

Library of Congress has promoted many programs that heighten enthusiasm about reading, such as book publishers' "I'd Rather Be Reading" campaign, ABC's "Captain Readmore," and CBS's "Read More About It."[79] These efforts expanded dramatically when PBS and ABC announced their role in Project Literacy U. S. (PLUS), which included major TV coverage in conjunction with publicity about existing state and local literacy efforts. The program has been supported by 80 national organizations, and PLUS task forces were organized in hundreds of communities.[80] Bookstores and comic book publishers sponsored a fund-raising campaign for literacy training in summer of 1986, entitled, "Give the Gift of Literacy," and magazine publishers designated August of 1986 "Magazine Literacy Month." President Reagan declared that September 1986 was "Adult Literacy Awareness Month." The coming year promises more of this sort of publicity, aimed at greater public awareness of literacy problems and fund-raising for existing literacy training programs. In fact, 1987 will be "the Year of the Reader," according to the Center for the Book, the International Reading Association and the American Booksellers Association. Congress will be asked to approve a resolution in support of this year-long campaign, "aimed at restoring the act of reading to a place of preeminence in our personal lives and in the life of the nation."[81]

With all this publicity about reading problems, and with the prospect of substantial fund-raising, what more is needed? We believe that the current campaign has too many features of previous efforts to "wipe out illiteracy," chiefly, an insufficient understanding of the nature and degree of literacy problems, insufficient federal and state dollars, and insufficient breadth of concept. Private giving is a worthy and venerable tradition in America, but it won't substitute for a sustained government commitment both to policies and budgets that will give literacy education a higher priority. Our nation can afford it; indeed, in the long run, we cannot afford to economize on literacy. Publicity campaigns may heighten public awareness and attract the media's attention, but they are inevitably short-lived and yield less real program money and fewer long-term literacy outcomes than a solid, ongoing partnership between literacy agencies and government at the federal, state, and local levels.

Second, many of the current campaigns are primarily focused on people who lack even the most rudimentary reading skills, generally lumped together as the "illiterate" or the "functionally illiterate." The publicity for these campaigns includes images of people who cannot read their children a story, people who cannot tell a nutrient from a deadly poison, people who know they are illiterate and try to hide it. That there are too many such people in our society is true, and the agencies that strive to give the gift of literacy to the illiterate deserve our private and public support. But we are concerned that public awareness broaden, that the public's literacy agenda involve more people, more institutions, and more skills at different levels. If public television can effectively teach initial reading skills, it ought to be able to contribute to the upgrading of adult reading skills needed to work at more complex jobs, to assess complex public issues, and to read and enjoy more demanding prose.

Employers in private and public areas (including the military) have a role to play also, beyond boosting public awareness of the so-called illiterate and

beyond job-specific training. It may be in the short-run economic interest of firms to train their employees only for specific, existing jobs; but in the long-run, the educational activities of business must be geared toward more general, critical reading skills. The need is reflected in the increasing endorsement by business leaders for employees who are liberally educated and well versed in literacy skills, not vocationally trained. If such broad training is what employers want and need, and if it is what they expect the schools to provide, they must dramatize that conviction by reinforcing the same kind of skills in the continuing education and training of their employees, in job responsibilities, and in compensation schemes. Too few training dollars are devoted to the literacy proficiencies of existing employees and to the educational needs of those outside of the managerial and professional ranks. Youth employment and training agencies, community service organizations, museums, libraries, bookstores, and prisons also have a role to play. However, we don't pretend to have specific answers. But the findings of the NAEP young adult literacy assessment have propelled us to the conclusion that literacy education must be advanced at many levels and in many settings in our society.

There are, of course, promising programs that tackle literacy problems along a diverse range of abilities, such as the Comprehensive Competencies Programs of the Remediation and Training Institute.[82] Others, such as the San Francisco Renaissance program, teach technical reading to high school dropouts, office-related literacy skills for better job placement, and a "new scholars" course for adults reading below the seventh-grade level.[83] Many other similar programs could be cited. They should be encouraged, funded, and allowed to survive beyond the time when public interest in literacy problems subsides. Literacy is not an acute crisis; it is a chronic problem. Thus, remedies must be sustained consistently over the years as new cohorts go through school and enter adult roles.

Our recommendation for broader literacy education outside of schools is analogous to our recommendation for broader literacy education within the schools. More people need literacy training than is typically thought, and more people need to be engaged in giving the training. In schools, we urge a revamping of the reading and English curriculum, but we also insist that the teachers of all other subjects take on literacy as part of their curriculum. Similarly, outside of schools, we urge more support, including private and government support, for traditional literacy training agencies, but at the same time we insist that many more agencies must promote the abilities to read in complex and thoughtful ways. The chief responsibility may still lie with the schools, the workplace, the print media, and the community literacy programs; but libraries, bookstores, and other agencies can play a role too. Considering that in the NAEP literacy assessment respondents who engaged in extensive reading activities scored higher than those who did not, independent of their educational attainment, we should strive to engage as many institutions as possible in the effort to upgrade literacy skills.

The Family

Finally, it is important to reassert that along with the school, the most important agency in the training of literacy is the family. The family has played

a crucial role in the educational aspirations and attainments of Americans in the past. Groups that have made dramatic increases in literacy skills, such as White women in the early national period, Black Americans after the Civil War, and European immigrants in the late nineteenth century, have done so through a combination of family and school influences. Data collected for the NAEP assessment suggest that the literacy environment and practices of the young adults' homes influenced their literacy skills. Public policy cannot shape family environments as directly as we shape public institutions, but we need to acknowledge the importance of family values and family efforts in fostering children's literacy skills. Not all children are blessed with literate parents, but most are; and all parents, regardless of their skills, can imbue their children with a sense of the importance of literacy. Literacy campaigns should strive to enlist families in this effort, and training programs aimed at preventing school dropouts, reducing unemployment, and combating poverty should contain literacy training components for family members.

'Public policy cannot shape family environments as directly as we shape public institutions, but we need to acknowledge the importance of family values and family efforts in fostering children's literacy skills.'

Labor

> *The relatively poor performance of minority group members and those who terminated their education early, combined with the projected changes in demographics for the 18- to 23-year-old population, suggest that unless we develop and implement more appropriate intervention as well as prevention strategies, America will have a less literate pool of young adults to fill its human resource needs over the next decade or so.*
>
> —Kirsch & Jungeblut, 1986a, p.6.

Labor market research in the United States has consistently shown that the formal educational attainment of young workers has a major independent impact on their labor force behavior, their employment experiences, and their earnings.[84] With more years of formal schooling, young adults tend to participate more actively in the labor force, avoid unemployment problems more successfully, and achieve higher annual earnings. The industrial shifts in the American economy toward high technology manufacturing industries and toward many service-oriented industries have increased the demand for more highly educated workers and reduced many traditional employment opportunities for the less educated, especially high school dropouts.[85]

In contrast to the rising literacy demands argument, some writers emphasize that in certain jobs, skill levels have been reduced over time, not increased, and that white-collar jobs, like blue-collar crafts in the nineteenth century, have been downgraded for many workers.[86] Other analysts continue to emphasize the literacy requirements which accompany a shift to an "information society," the projections of a continuing shift from blue-collar to white-collar jobs, and the need for problem-solving flexibility in the education of future workers.[87] In sorting out this complicated debate, Spenner points out that occupational upgrading has come mainly through changes in the aggregate composition of occupations in the labor market, while downgrading has come within particular jobs through automation, increased specializa-

tion, or tighter managerial control.[88] The fundamental changes in the industrial structure of the national economy will likely dominate shifts in the occupational structure toward white-collar occupations with higher literacy requirements. The effect of changing technology in the workplace is very different on different workers; some are faced with the morale and compensation problems associated with reassignment of job functions while others are challenged to upgrade their education and at-work competencies. Regardless of the projections of job types in the near future, employers respond to workers' educational and literacy proficiency attainments to some degree, so more participation by workers in decision-making and skilled operations will depend to some degree upon the skills they attain. This is why we argue that an escalation in literacy expectations need not depend upon a demonstration of current literacy demands in the workplace.

"The relatively strong and uniform associations between literacy proficiencies and labor market success among young adults indicate that literacy gaps will be a major factor in determining disparities in employment and incomes in the American economy in the future."

We have noted in an earlier section the projected contraction in the 18-24-year-old population over the next decade, with a concomitant increase in the proportion of Blacks and Hispanics (from 20 percent in 1985 to over 24 percent in 1994). If the present literacy trends for different race/ethnicity groups continues through the coming decade, then the literacy proficiencies of people 18-24 years old will likely decline. In addition, the present disparities in income and occupational status across different race/ethnicity groups will likely continue, even with elimination of bias in hiring and promotion practices.

Literacy and Occupational Training

> *The overwhelming majority of America's young adults are able to use printed information to accomplish many tasks that are either routine or uncomplicated. It is distressing, however, that relatively small proportions of young adults are estimated to be proficient at levels characterized by the more moderate or relatively complex tasks. It has been argued that many, if not most, of society's managerial, professional, and technical service-sector jobs will require participation in some postsecondary program. This argument raises the question of whether or not individuals with more limited literary skills will qualify for or benefit from such education and training programs.*
>
> —Kirsch & Jungeblut, 1986a, p.6.

Viewed from the standpoint of those young adults most in need of better job opportunities, poverty, limited schooling, and low literacy skills are closely connected. The NAEP data give little support to the notion that many of the poor are an untapped store of existing skills and abilities, tethered to their lower status only by misfortune or discrimination. Data summarized in Section 5 show that the poorest tend also to have the least number of years of schooling and to score the lowest on literacy skills. To bring most of these people into productive occupations that provide earnings sufficiently high to escape poverty will require more than job-search training, or short-term exposure to subsidized job programs. For many, literacy abilities are so low

that the average occupational training program is beyond their current performance level. If we are serious in our efforts to bring self-sufficiency to this group, then funding must be allocated to mount programs that will attend to their multiple needs. The relatively strong and uniform associations between literacy proficiencies and labor market success among young adults indicate that literacy gaps will be a major factor in determining disparities in employment and incomes in the American economy in the future. The existence of large literacy differences between the "haves" and "have nots" will adversely affect existing large-income disparities between the economic haves and have nots of our society. A renewed emphasis on raising the literacy skills of those at the bottom of the literacy income distribution in America seems particularly urgent if the nation wishes to achieve a more egalitarian distribution in the future.

Citizenship

Thomas Jefferson wrote in 1787, "Were it left to me to decide whether we should have a government without newspapers, or newspapers without a government, I should not hesitate a moment to prefer the latter. But I should mean that every man should receive those papers and be capable of reading them."[89] Jefferson and like-minded founding fathers concluded that the high literacy demands of republican government required the state to play a significant role in education. Many of their contemporaries feared state activity in this area, and others believed that schools were sufficient as they were—brief sessions, locally controlled, and subsidized by parental fees. Only later in the nineteenth century did most states act upon the Jeffersonian literacy expectations and offer without charge a more thorough common education.

The most frequently stated justification for this state activity was the requirements of citizenship. "The foundations of our political institutions rest upon man's capacity for self-government," said Pennsylvania's Superintendent of Common Schools in 1842. "Enlightened public opinion will be a wall of fire around our free institutions."[90] In our day, we tend to overlook the educational demands of citizenship because of the public emphasis on the economic functions of education. Yet the literacy demands of citizenship have become much greater than in Jefferson's day. The welfare state, itself a response to democratic aspirations and principles, has created government bureaucracies alongside the bureaucracies of industry; technology has made many issues harder to understand at the same time they have become more important; and the global scale of economic and political activities means that all citizens are directly or indirectly affected by faraway events. Using the example of legislation on a state's legal drinking age, Francis Schrag has argued that "to come to a decision over what appears to be a relatively straightforward issue, one in which the choice is neither momentous nor hinges on really arcane, technical information is no easy matter. The cognitive demands are extremely high."[91] Other issues, like nuclear disarmament, the federal deficit or acid rain are of the same or greater complexity. If democracy isn't to concede decisions on such issues to the experts and the politicians, we need citizens who have critical reading skills, including what

Kenneth Prewitt calls "scientific savvy" — not a theoretical understanding of all the areas of science involved in public policy but some skill at evaluating arguments based on statistics, some training in weighing conflicting evidence, and some understanding of the social and political context of scientific work.[92] One can easily see that if we wish to commit ourselves to a new escalation of literacy skills for the strengthening of democracy, it will involve not only English teachers, but science teachers, math teachers and history teachers as well.

One of our interpretations of the findings of the NAEP Young Adult Literacy Assessment is that most young adults do not possess a high level of critical reading skills. We have thus far emphasized that problem in our discussion of literacy and citizenship. Another major finding—that there are wide gaps between racial and ethnic groups in basic and middle-level literacy skills—also has political implications. If the stratification of literacy skills continues, it will reinforce existing occupational and income disparities, and residential segregation.[93] There is a growing danger of a bifurcated work force mirrored by a bifurcated educational system. Such disparities would, if unchecked, undermine the ameliorative effect that a large middle class has had on our political and economic system, frustrating attempts to generate equal employment opportunity, a more equal participation in American politics and society, and reductions in prevailing economic inequalities among racial groups.

Epilogue

> *It is clear from these data that "illiteracy" is not a major problem for this population. It is also clear, however, that "literacy" is a problem. Sizable numbers of individuals are estimated to perform within the middle range on each of the scales. Within these broad ranges, individuals are neither totally "illiterate" nor fully "literate" for a technologically advanced society.*
>
> —Kirsch & Jungeblut, 1986a, p.5.

'Another major finding—that there are wide gaps between racial and ethnic groups in basic and middle-level literacy skills—also has political implications. If the stratification of literacy skills continues, it will reinforce existing occupational and income disparities, and residential segregation.[93] There is a growing danger of a bifurcated work force, mirrored by a bifurcated educational system.'

The message from the Young Adult Literacy Assessment is neither of impending doom nor of catastrophe. Contrary to the Cassandra-like warnings that have been issued in recent years of a land populated by hordes of illiterates, America is not steering itself towards such imminent self-destruction. Few cannot read at all, and many of these appear to have multiple problems, of which illiteracy may not be the most severe. Yet these results carry warnings of a more subtle danger, of a chronic problem which, if left uncorrected, could slowly gnaw at the very strength of our national existence--the skills and abilities of our citizens. This potential danger is more real today than at any point in the past 40 years, given the internationalization of the world economy, the increasing openness of the American economy to foreign trade, and the human capital investments being made by many of our economic competitors throughout the world. We have no crisis to confront, yet the need to act is no less than if there were.

Literacy, beyond the basic ability to read and write, is fundamental to this democracy and to its future economic growth. We do not assume a necessity

for *all citizens to read at high levels;* but we do fear that the acquisition of literacy skills for many young adults stagnates at a level below what is needed for personal advancement and full participation in society. And a work force that fails to improve its literacy with each passing decade should be cause for alarm. So should the significantly large segment of the population who cannot easily comprehend passages with difficulty levels comparable to typical laws, political statements, and instructions for voting. The people who lack these skills are more likely to have limited formal education, to read little, and to avoid those print materials that are high in information content. If this is the life they voluntarily choose, we have little cause for forcing more formal education on them. But there is no evidence that these individuals have willingly chosen low literacy abilities.

We might compensate for low literacy abilities by downgrading job requirements, simplifying warranties, laws, and other reading materials, incorporating graphics to decrease the verbal demands of print, and writing with a limited vocabulary and a constrained syntax. Such efforts have been under way for many years under the motivation of *clear writing.*[94] We welcome them where they remove obtuseness, ambiguity, and prolixity, but there are limits on the employment of these ameliorations for the communication of complex ideas. *We should strive for a society in which schools, families, and other institutions can provide adequate literacy skills for all young adults.*

We will not collapse tomorrow from a lack of adequate literacy skills, but we may find that year by year, we continue to fall behind in international competitiveness, and that society becomes more divided between those who are skilled and those who are not. If information and technology continue to increase their importance in work and everyday life, even the average literate American will experience difficulty in meeting the literacy demands of the more skilled employment opportunities and in understanding the more complex issues of everyday life. These are the issues that are before us, the need for change is evident and immediate. If we do not act now, then when?

'We will not collapse tomorrow from a lack of adequate literacy skills, but we may find that year by year, we continue to fall behind in international competitiveness, and that society becomes more divided between those who are skilled and those who are not.'

References

Adult Performance Level Project. (1977). *Final report: The Adult Performance Level Study.* Washington, D. C.: U.S. Office of Education.

American Council of Life Insurance & the Health Insurance Association of America. (1986). *Teaching Topics, 33,* (3), Fall.

Armbruster, F. (1977). *Our children's crippled future: How American education has failed.* New York: Quadrangle Books.

Bachman, J.G., O'Malley, P.M., & Johnston, J. (1978). *Adolescence to adulthood: Change and stability in the lives of young men.* Institute for Social Research, University of Michigan, Ann Arbor.

Bailyn, B. (1960). *Education in the forming of American society.* Chapel Hill: University of North Carolina Press.

Baldwin, J.(1897). *School reading by grades: Sixth year.* New York: American Book Company.

Berlin, G., Sum, A., & Taggart, R. (1986). *Cutting Through,* A Report Prepared for the Ford Foundation Project on Social Welfare Policy and the American Future. New York, September.

Braverman, H. (1974). *Labor and monopoly capital: The degradation of work in the twentieth century.* New York: Monthly Review Press.

Carpenter, T.P., Corbitt, M.K., Kepner, H.S., Jr., Lindquist, M.M., & Reys, R.E. (1980). National assessment: A perspective of students' mastery of basic mathematics skills. In M.M. Lindquist (Ed.), *Selected issues in mathematics education.* Berkeley, CA: McCutchan Publishing Co.

Carroll, J. B., & Chall, J. S. (1975). *Toward a literate society.* New York: McGraw-Hill.

Caughran, A. M., & Lindlof, J. A. (1972). Should the "Survival Literacy Study" survive? *Journal of Reading*, March, 429-435.

Cole, J. (1986). Letter to Friends of the Center for the Book. April. Washington, D. C.: Center for the Book, Library of Congress.

Coleman, J., et al. (1966). *Equality of educational opportunity.* Washington, D. C.: Office of Education.

Copperman, P. (1978). *The literacy hoax: The decline of reading, writing, and learning in the public schools and what we can do about it.* New York: William Morrow.

Cremin, L. A. (1976). *Public education.* New York: Basic Books.

Cremin, L. A. (1980). *American education: The national experience 1783-1876.* New York: Harper & Row.

D'Amico, R. (1984). The time use behavior of young adults. In M. Borus, (Ed.), *Youth and the labor market.* Kalamazoo: W.E. Upjohn Institute for Employment Research.

Davis, F. (1974). *Teaching reading in early England.* New York: Barnes & Noble.

Duncan, O.D., Featherman, D.L., & Duncan, B. (1972). *Socioeconomic background and achievement.* New York: Seminar Press.

Felker, D.B. (Ed.). (1980). *Document design: A review of relevant research.* Report AIR-75002-4/80-TR. Washington, D.C.: American Institutes for Research.

Gadway, C. J., & Wilson, H. A. (1976). *Functional literacy: Basic reading performance.* Denver: Education Commission of the States.

Gray, W., & Munroe, R. (1929). *The reading interests and habits of adults.* New York: Macmillan Co.

Gray, W. (1933). Catching up with literacy. *Proceedings of the 71st annual meeting of the National Education Association.* Washington, D.C.: National Education Association.

Gray, W. (1956). *The teaching of reading and writing.* Chicago: Scott, Foresman and Co.

Harrington, P., Sum, A., & Fogg, W. (1986). *Declining real incomes of adult men in the U.S., 1973-1985: Implications for education and training programs.* Center for Labor Market Studies, Northeastern University.

Heath, S. B. (1980). The functions and uses of literacy. *Journal of Communication,* Winter, *30,* (1), 123-133.

Heath, S. B. (1984). *Ways with words: Language, life and work in communities and classrooms.* Cambridge: Cambridge University Press.

Heslep, R.D. (1969). *Thomas Jefferson and education.* New York: Random House.

Heyns, B. (1978). *Summer learning and the effects of schooling.* New York: Academic Press.

Hill, R.C. (1981). Education and earnings: A review of the evidence. *Economics of Education Review,* Fall, 403-420.

Illiteracy in America. (1986). Joint hearings before the House subcommittee on elementary, secondary, and vocational education and the Senate subcommittee on education, arts and humanities. August 1, October 1 and 3, 1985. Washington, D.C.: U.S. Government Printing Office.

Independent. (1919). The attack on illiteracy. *The Independent, 97,* March 22, 391-392.

Jencks, C., et al. (1972). *Inequality: A reassessment of the effect of family and schooling in America.* New York: Harper & Row.

Jencks, C., et al. (1979). *Who gets ahead? The determinants of economic success in America.* New York: Basic Books.

Kaestle, C. F. (1981). Literacy and mainstream culture in American history. *Language Arts, 58,* 207-218.

Kaestle, C. F. (1983). *Pillars of the republic: Common schooling and American society, 1780-1860.* New York: Hill & Wang.

Kaestle, C. F. (1985). The history of literacy and the history of readers. In E. Gordon (Ed.), *Review of research in education.* Washington D.C.: American Educational Research Association.

Kerr, C., Dunlop, J. T., Harbison, C. & Myers, C. A. (1964). *Industrialization and industrial man.* New York: Oxford University Press.

Kintsch, W., & Vipond, D. (1979). Reading comprehension and readability in educational practice and educational theory. In L.G. Nilsson (Ed.), *Perspectives on memory research.* Hillsdale, N.J.: Erlbaum.

Kirsch, I., & Guthrie, J. T. (1977-78). The concept and measurement of functional literacy. *Reading Research Quarterly, 23* (14), 485-507.

Kirsch, I., & Jungeblut, A. (1986a). *Literacy: Profiles of America's young adults.* Report No. 16-PL-02. Princeton, N.J.: National Assessment of Edu-cational Progress.

Kirsch, I., & Jungeblut, A. (1986b). *Literacy: Profiles of America's young adults — final report.* Report No. 16-PL-01. Princeton, N.J.: National Assessment of Educational Progress.

Klare, G.R. (1984). *Readability.* In P.D. Pearson, R. Barr, M.L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research.* New York: Longman.

Lee, G. C. (Ed.).(1961). *Crusade against ignorance: Thomas Jefferson on education.* New York: Teachers College Press.

Levin, H., & Rumberger, R. (1983). The low-skill future of high-tech. *Technology Review, 86* (6), 18-21.

Library of Congress. (1985a). *Information Bulletin.* April 15. Washington, D. C.: Library of Congress.

Library of Congress. (1985b). *News from the Library of Congress.* December 12. Washington, D. C.: Library of Congress.

Louis Harris and Associates. (1970). *Survival literacy study.* Washington: The National Reading Council.

Louis Harris and Associates. (1971). *The 1971 national reading difficulty index: A study of functional reading ability in the United States, for the National Reading Center.* Washington, D. C.: The National Reading Center.

Mann, H. (1867). *Lectures and annual reports on education.* Cambridge, MA: The editor.

Manski, C.F. & Wise, D.A. (1983). *College choice in America.* Cambridge, MA: Harvard University Press.

Meyer, R.H., & Wise, D.A. (1982). *The transition from school to work: The experience of blacks and whites.* Working paper No. 1007. Cambridge, MA: National Bureau of Economic Research.

Mikulecky, L. (1980). Functional writing in the workplace. In L. Gentry (Ed.), *Research and instruction in practical writing.* Los Alamitos, CA: Southwest Regional Laboratory for Educational Research and Development.

Morrison, D.C. (1986). Babes under arms. *National Journal*, March 8, 579-583.

Murphy, R. T. (1973). *Adult functional reading study*. Princeton, NJ: Educational Testing Service.

Nafziger, D. H., Thompson, R. B., Hiscox, M. D., & Owen, T. R. (1976). *Tests of functional adult literacy: An evaluation of currently available instruments*. Portland, OR: Northwest Regional Educational Laboratory.

National Assessment of Educational Progress. (1976). *Adult work skills and knowledge: Selected results from the first national assessment of career and occupational development*. Denver: National Assessment of Educational Progress.

National Assessment of Educational Progress. (1985). *The reading report card, progress towards excellence in our schools*. Princeton, NJ: Educational Testing Service.

National Assessment of Educational Progress. (1986a). *Writing trends across the decade, 1974-84*. Princeton, NJ: Educational Testing Service.

National Assessment of Educational Progress. (1986b). *NAEP technical report*. Princeton, N.J.: National Assessment of Educational Progress.

National Center for Health Statistics. (1973). *Literacy among youths 12-17 years, United States*. Washington, D.C.: Department of Health, Education and Welfare.

National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington, D.C.

Office of the Assistant Secretary of Defense. (1982). *Profile of American youth: 1980 nationwide administration of the Armed Services Vocational Aptitude Battery*. Washington, D.C.: Manpower, Reserve Affairs and Logistics.

Olson, D. R. (1977). The languages of instruction: The literate bias of schooling. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), *Schooling and the acquisition of knowledge*. Hillsdale, NJ: Erlbaum.

Olson, L. (1986). Inadequate education is identified as barriers to urban minorities. *Education Week*, 6 (8), October 29, 1, 17.

Palincsar, A.S., & Brown, A.L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 1*, 117-175.

Patching, W., Kameenui, E., Carnine, D., Gersten, R., & Colvin, G. (1983). Direct instruction in critical reading skills. *Reading Research Quarterly, 18*, 406-418.

Perfetti, C.A. (1985). *Reading ability*. New York: Oxford University Press.

Powell, A.G., Farrar, E., & Cohen, D.K. (1985). *The shopping mall high school: Winners and losers in the educational marketplace*. Boston: Houghton Mifflin.

Prewitt, K. (1983). Scientific illiteracy and democratic theory. *Daedalus*, 112 (2), 49-64.

Report of the Commissioners Appointed to Fix the Site of the University of Virginia (1797-1820). *The Annals of America, 4, 1797-1820*, 510-514.

Resnick, D., & Resnick, L. (1977). The nature of literacy: An historical exploration. *Harvard Educational Review, 43*, 370- 385.

Rice, J.M. (1893). The public-school system of the United States. (reprint ed. New York: Arno Press & The New York Times, 1969).

Rock, D.E., et al. (1985). *Study of excellence in high school education, longitudinal study, 1980-1982, final report*. Princeton, NJ: Educational Testing Service.

Saks, D.A. (1984). *A legacy for the 21st century: Investment opportunities in our children's schooling*. Study prepared for the Committee for Economic Development.

Schrag, F. (forthcoming). *Thinking in school and society*. New York: Routledge & Kegan Paul.

Silvestri, G.T., & Lukasiewicz, J.M. (1985). Occupational employment projections: The 1984-95 outlook. *Monthly Labor Review*, November, 42-59.

Smith, J.P., & Welch, F.R. (1985). *Closing the gap: Forty years of economic progress for blacks*. Santa Monica, CA: Rand Corporation.

Soltow, L., & Stevens, E. (1981). *The rise of literacy and the common school in the United States: A socioeconomic analysis to 1870*. Chicago: University of Chicago Press.

Spenner, K.I. (1985). The upgrading and downgrading of occupations: Issues, evidence, and implications for education. *Review of Educational Research, 55*, (Summer), 125-154.

Spangenberg, G. (1986). The Broadcast media and literacy. In Business Council for Effective Literacy, *Newsletter*, 1 (8). July.

Statistical *abstract of the United States 1982-83* (1984). Washington, D.C.: U.S. Government Printing Office.

Stedman, L. S., & Kaestle, C. F. (1986). *An investigation of crude literacy, reading performance, and functional literacy in the United States*. Madison, Wisconsin: Wisconsin Center for Education Research, University of Wisconsin.

Sticht, T. G., (Ed.) (1975). *Reading for working: A functional literacy anthology*. Alexandria, VA: Human Resources Research Organization.

Sum, A. (1983). *Educational attainment, academic ability, and the employment and earnings of young persons in the United States*. Report prepared for the National Council on Employment Policy, Washington, D.C.

Sum, A., Harrington, P., & Goedicke, W. (1986). *Skills of America's teens and young adults: Findings of the 1980 National ASVAB Testing and their implications for education, employment and training policies and programs*. Report prepared for the Ford Foundation, New York.

Sum, A., Taggart, R., & Fogg, W. (1986). *Deindustrialization, real earnings declines of young adult males, and the decline in marriage*. Center for Labor Market Studies, Boston: Northeastern University.

Taggart, R. (1983). *An overview of the functional competencies program*. Alexandria, VA: Remediation and Training Institute.

Talbot, W. (1916). *Adult illiteracy*. Washington: Bureau of Education.

Taylor, S.E. (1963). Eye movements in reading: Facts and fallacies. *EDL Reading Newsletter No. 30*. Huntington, N.Y.: Educational Development Laboratories.

Thorndike, E.L. (1917). The understanding of sentences: A study of errors in reading. *Elementary School Journal, 17*, 98-114.

Thurow, L. (1985). *The zero sum solution*. New York: Simon and Schuster.

UNESCO. (1957). *World illiteracy at mid-century*. Paris: UNESCO.

U.S. Bureau of the Census. (1971). *Illiteracy in the United States: November, 1969*. Current Population Reports, series P-20, No. 217. U.S. Department of Commerce, Washington, D.C.

U.S. Bureau of the Census. (1984). *Census of population, subject reports, persons in institutions and other group quarters* (1980). Report PC80-2-4D. Washington, D.C.: U.S. Government Printing Office.

Venezky, R. L. (1982). The origins of the present-day chasm between adult literacy needs and school literacy instruction. *Visible Language, 16:2*, 113-126.

Vinovskis, M. A., & Bernard, R. (1978). Beyond Catharine Beecher: Female education in the antebellum period. *Signs, 3*, 856-869.

Wilson, W.J. (1980). *The declining significance of race*. Chicago: University of Chicago Press.

Wilson, W.J., & Neckerman, K.M. (1984). *Poverty and family structure: The widening gap between evidence and public policy issues*. Paper prepared for the Conference on Poverty and Policy: Retrospect and Prospects, Williamsburg, VA.

Winston, S. (1930). *Illiteracy in the United States from 1870 to 1920*. Chapel Hill: University of North Carolina Press.

Yerkes, R. M. (Ed.). (1921). *Psychological examining in the U.S. Army*. Washington: National Academy of Sciences.

Footnotes

[1]The terms *basic* and *higher level* are used informally. On the difficulties of defining meaningful divisions of the literacy continuum, see Kirsch & Jungeblut, 1986a, 1986b; and Kirsch & Guthrie, 1977-78.

[2]Data are for 1980, which is the last year reported in the *Statistical Abstract of the United States 1982-83*.

[3]Both reports are entitled *Literacy: Profiles of America's Young Adults* and are available from the National Assessment of Educational Progress, Educational Testing Service, Rosedale Road, Princeton, NJ 08541. The summary report (No.16-PL-02) is referenced here as Kirsch & Jungeblut, 1986a while the fuller final report (No.16-PL-01) is referenced as Kirsch & Jungeblut, 1986b.

[4]Kirsch & Jungeblut, 1986a, p.3.

[5]For a recent discussion on the components of reading as viewed by a cognitive psychologist, see Perfetti, 1985.

[6]Nafziger, et al., 1976, p.19.

[7]Gray, 1956, p.12.

[8]UNESCO, 1957, p.18.

[9]Heslep, 1969, p.88.

[10]Resnick & Resnick, 1977; but see also Davies, 1974.

[11]U.S. Bureau of the Census, 1971.

[12]Kaestle, 1983; Cremin, 1980; Soltow and Stevens, 1981.

[13]Venezky, 1982.

[14]Baldwin, 1897, p.3.

[15]Rice, 1893, p.234.

[16]Vinovskis & Bernard, 1978, p.863.

[17]Talbot, 1916, p.7.

[18]Winston, 1930, p.58.

[19]Independent, 1919, p.1.

[20]Yerkes, 1921, p. 743.

[21]Gray, 1933.

[22]Stedman & Kaestle, 1986.

[23]Carroll & Chall, 1975.

[24]Kirsch & Guthrie, 1977-78.

[25]Louis Harris and Associates, 1970.

[26]Caughran & Lindlof, 1972.

[27]Louis Harris and Associates, 1971.

[28]Murphy, 1973; Kirsch & Guthrie, 1977-78.

[29]Gadway & Wilson, 1976.

[30]Adult Performance Level Study, 1977.

[31]Illiteracy in America, 1986, p.5.

[32]See, for example, Armbruster, 1977; Copperman, 1978.

[33]D.R. Olson, 1977; Heath, 1980.

[34]Sticht, 1975; Mikulecky, 1980.

[35]Office of the Assistant Secretary of Defense, 1982.

[36]U.S. Bureau of the Census, 1984. (Data are for 1980.)

[37]National Assessment of Educational Progress, 1976.

[38]Gadway & Wilson, 1976.

[39]Adult Performance Level Project, 1977; Louis Harris and Associates, 1970; National Center for Health Statistics, 1973.

[40]In adopting the organization of texts and tasks described here, we are not expressing a major disagreement with the authors of the study over what the most important results are. Instead, we are offering an alternative route to these same results. In doing this, we found it desirable to merge the NAEP scale items with the other prose items, since the respondents had no reason to think these were distinct categories, and the skills tapped are the same. On the other hand, we found the document category unwieldy, with more than half of the 105 test items assigned to it (63 items in all). We also preferred to have one set of categories based on the same feature (text type), rather than categories that are defined by three different features: use in NAEP reading tests (NAEP scale), document type (prose and document scales), and key processing operation (computation scale).

[41]National Assessment of Educational Progress, 1985.

[42]Kirsch & Jungeblut, 1986b.

[43]Taylor, 1963.

[44]Scale scores and Item Response Theory (IRT) are explained in Kirsch & Jungeblut, 1986b, Appendix B.

[45] Kirsch & Jungeblut, 1986a, p.14.

[46]Carpenter, et al., 1980, pp.220f. Thorndike 1917, p.114, made a similar observation 70 years ago, based on analyses of errors made by students in paragraph comprehension tests. His conclusion was that paragraph understanding was of the same "nature as the more obvious forms of reasoning in mathematics and science."

[47]Carpenter, et al., 1980, p.240.

[48]Carpenter, et al., 1980.

[49]Throughout this and the following sections we use the scale standard deviation of 50 for comparisons of subgroups whose true standard deviations may vary from 50. The true within-group standard deviations will be reported in a forthcoming technical report from NAEP.

[50]Office of the Assistant Secretary of Defense, 1982; Rock, et al., 1985.

[51]National Assessment of Educational Progress, 1985; National Assessment of Educational Progress, 1986a.

[52]Nearly 80 percent of the differences between the test scores of White and Black young adults remains even after controlling for parents' educational attainment, geographic region, attainment, and reading literacy materials in the home. See Kirsch & Jungeblut, 1986b.

[53]Morrison, 1986.

[54]For a comprehensive review of the quantitative evidence on the relationships between educational attainment, academic ability, and family background, see Jencks, et al., 1972; Duncan, Featherman, & Duncan, 1972; Jencks, et al., 1979. For a more descriptive analysis of the ways in which parents influence the schooling of their children at the high school level see Powell, Farrar, & Cohen, 1985.

[55]Analysis of the 1980 ASVAB test data revealed that the educational attainment of the mothers of respondents was as equally good a predictor of reading skills and AFQT test scores as a more composite measure of socioeconomic background also taking into account father's educational attainment and occupation. See Office of the Assistant Secretary of Defense, 1982.

[56]Findings of these multivariate statistical analyses are presented in Kirsch & Jungeblut, 1986b, Ch. 7.

[57]A recent longitudinal analysis of achievement gains among youth who remained in high school from their sophomore year to graduation and of a sample of dropouts revealed significantly greater gains in achievement for those who remained in school, particularly in mathematics (Rock, et al., 1985). Analyses of learning gains and declines among youth during the summer, especially low income and minority youth, reveal that their academic proficiencies often decline during the period when they are out of school (Heyns, 1978).

[58]Manski & Weiss, 1983; Meyer & Wise, 1982; Bachman, O'Malley, & Johnston, 1978.

[59]Office of the Assistant Secretary of Defense, 1982.

[60]U.S. Bureau of the Census, 1984.

[61] *Ibid.*, Table B, p.4.

[62]The real median incomes of Black males appears to have peaked in 1973. Between 1973 and 1984, real median incomes of all Black males declined by 15.7 percent. (Harrington, Sum, & Fogg, 1986).

[63]Rock, et al., 1985.

[64] *Ibid.*

[65]Some of these respondents may have been studying for the GED at the time of the interview and will eventually receive a GED certificate.

[66]National Commission on Excellence in Education, 1983; Saks, 1984.

[67]D'Amico, 1984.

[68] *Report of the Commissioners*, 1797-1820, pp.510-515.

[70]The percentage of expository material found in a basal reader will vary according to how *expository* is defined (e.g., are biographies narrative or expository?) and whether titles or actual pages are counted. Through the 1970s the percentage of expository material, based on page counts, ranged from five to ten percent for the major basal series. (Venezky, 1982).

[71]What we are *not* suggesting is that reading be taught primarily from charts, almanacs, advertisements, etc. Exposure to these document forms should occur somewhere in the elementary curriculum, but the more pressing need is to teach information processing skills that rely heavily on criti cal thinking and reasoning. With careful planning this could be achieved with fictional passages as well as with expository ones. It might also be taught in science, math, and social studies classes, as well as in reading classes.

[72] *Readability* involves educational, psychological, and political issues that are outside of the scope of the present report. For a comprehensive survey of the topic see Klare, 1984. Also of interest is Kintsch & Vipond, 1979.

[73]E.g., Palincsar & Brown, 1984; Patching, Kameenui, Carnine, Gersten & Colvin,1983.
[74]National Assessment of Educational Progress, 1985.
[75]Bailyn, 1960.
[76]Coleman, et al., 1966; Jencks, et al., 1972.
[77]Heath, 1984.
[78]Cremin, 1976.
[79]Library of Congress, 1985a
[80]Library of Congress, 1985b; Spangenberg, 1986.
[81]Cole, 1986.
[82]Taggart, 1983.
[83]American Council of Life Insurance & Health Insurance Asociation of America, 1986.
[84]Bachman, O'Malley, & Johnston J., 1978; Berlin, Sum, & Taggart, 1986; Smith & Welch, 1985; Hill, 1981; Sum, 1983.
[85]Saks, 1984; Silvestri & Lukasiewicz, 1985; Sum, Harrington, & Goedicke, 1986.
[86]Braverman, 1974, Levin & Rumberger, 1983.
[87]Kerr, Dunlop, Harbison, & Myers, 1964.
[88]Spenner, 1985.
[89]Letter to Edward Carrington, Paris, January 16, 1787. Reprinted in Lee, 1961, p.102.
[90]Kaestle, 1983, p.97.
[91]Schrag, forthcoming.
[92]Prewitt, 1983.
[93]Sum, Taggart, & Fogg, 1986; Wilson, 1980; Wilson & Neckerman, 1984. See also the recent report by J. D. Kasarda, described in Olson, 1986.
[94]Current reports on clear writing efforts can be found in the monthly newsletter of the Document Design Center, American Institutes of Research (Washington, D.C.), and in a recent special issue of *Visible Language* (Spring 1986, vol. 20, No.2). For a review of research on document design, see Felker, 1980.

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Acknowledgments

The authors wish to express their thanks to Gordon Berlin, Robert Calfee, Lee Hansen, Lawrence Stedman, and Robert Taggart for their thoughtful comments on earlier drafts of this report; to Karen Donnelly, Lois O'Brien Opalewski, and Susan Pittelman at the University of Wisconsin and Sheila Paliner at Northeastern University for accurate and speedy staff support; to Neal Fogg and Paul Harrington at Northeastern University and to Laura McCamley and Judy Pollack at ETS for research and programming assistance; and to Lynn Gross at the University of Delaware who typed and retyped every version of the report and who helped coordinate this effort across the eastern one-third of the country.